Visual Guide to the National Parks of Argentina

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National Parks
of Argentina

Financed by:

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de Medio Ambiente

Organismo Autónomo
Parques Nacionales

Gran Vía de San Francisco, 4
28005 Madrid

Primera edición:
diciembre de 2005

ISBN: 84-8014-642-7

NIPO 311-05-029-7

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When Nature warns us that she is only one on the whole planet, and tries to get us to breathe in harmony with her rhythms, we can but respect her fragile and dynamic balance and accept that everything within our grasp will only succeed if we contribute to that necessary unity. The importance of heeding our natural environment and become aware of its rhythms and cycles will reward us in the long run, with additional benefits to the ones that this attitude gives us in itself, inevitably through an honest evaluation of our own nature.

Promoting protected areas and the conservation of biodiversity in Argentina (that the Autonomous Organization National Parks of the Spanish Ministry of the Environment supports in publishing this guide), is coherent with the interest in cooperation between the two countries and is a sign of respect to a rich wisdom, without which it is useless to measure oneself but is enriching to pause and observe.

The case of Argentina, a paradigm of the biological values of Latin America proves to be particularly enlightening with respect to the willingness to increase that attention and sympathy between man and nature as far as the creation of these protected areas passes through the unconditional support of the indigenous communities of each areas.

Thus the objectives and aims of the Argentine National Parks Administration include the reaching of the necessary agreements with the population that live in the immediate neighbourhood of each area to reach the best results, that is a use that foments sustainable development of the regions that are also converted into tourist attractions of the first order. It could not be any other way.

Without doubt, a marvelous display of confidence in the future, of faith in the generosity and abundance of the environs, and a wager on the capacity for understanding and concord on the road that will integrate the double noun "man/nature", that transcends confrontational duality and allows us to proceed in harmony that is supportive, natural and pacific.

As National Parks are symbolically important as places where the attitudes of caring and protecting, desirable in the whole of Nature, this book is only (and not less than) a symbol of the cultural and emotional links that tie Argentina to Spain, that contributes towards harmonizing a common and unique nature, and a purpose to obey the basic tenet of harmonizing the breathing of brother countries.

Antonio Serrano Rodríguez
General Secretary for Territory and Biodiversity
of the Spanish Ministry of the Environment

With the publication of this visual guide to the national parks of Argentina we are but paying an old debt. A debt with the many thousands of visitors who choose to visit parks every year; a debt with those who yearn to know more about the protected natural areas of our country, who contact us daily for information; and finally, with those who work all over the country, and, carrying out their various responsibilities, are committed to the protection of our natural and cultural heritage.

From the northern province of Jujuy to the southernmost corner of the country, the province of Tierra del Fuego, the 34 protected areas offer us diversity of species and wonderful contrasts in habitat.

The reader will find herein information on the national system of protected areas in Argentina, its history, its objectives, recreational and tourist activities, notable species and its contribution to regional and national development.

Our task, as described in these pages, will ensure the conservation of our cultural and natural diversity, key aspects in attaining environmental sustainability as well as social, economic and institutional development in the environs.

National parks promote the conservation of native habitats by stimulating reflection and through the commitment to protect nature and those cultural relationships that are, and have been, the source of sustainability both at present and in the past. Thus protected areas favour contacts with the native landscapes, dialogue, and intercultural respect as well as communication between peoples, stimulating and diversifying regional economies.

This guide would never have seen the light of day without the fundamental economical support of the Organismo Autónomo Parques Nacionales de España (Autonomous Agency of National Parks of Spain). To them we extend our deepest thanks.

And further thanks to the thousands of the world's citizens who choose us as a destination and support us every day. We await them - on these pages and in the field, in order to continue building, from now on, a better future.

Ing. Agr. Héctor Mario Espina
President of the Board
National Parks Administration of Argentina

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VISUAL GUIDE
to the NATIONAL PARKS
of ARGENTINA
is a publication of:

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Pre-press: Layout

Print: ARTEGRAF, S.A.

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How to use this Guide

The guide is divided in four parts following the four regions used by the National Parks Administration. Each region is identified by a colour code to facilitate finding.

The protected areas in each region are arranged chronologically so as to put them in the historical context under which they came into being.

On the front fly-leaf there is a list in **alphabetic order** for quick reference to the area sought.

In the **Introduction** there is a précis of the history and objectives of the National System of Protected Areas. Further, there is a map and characteristics of the eco-regions that the system aims to cover. In the **Appendix** you can find where to increase the information given in this guide and recommendations for visits to protected areas causing the least possible impact.

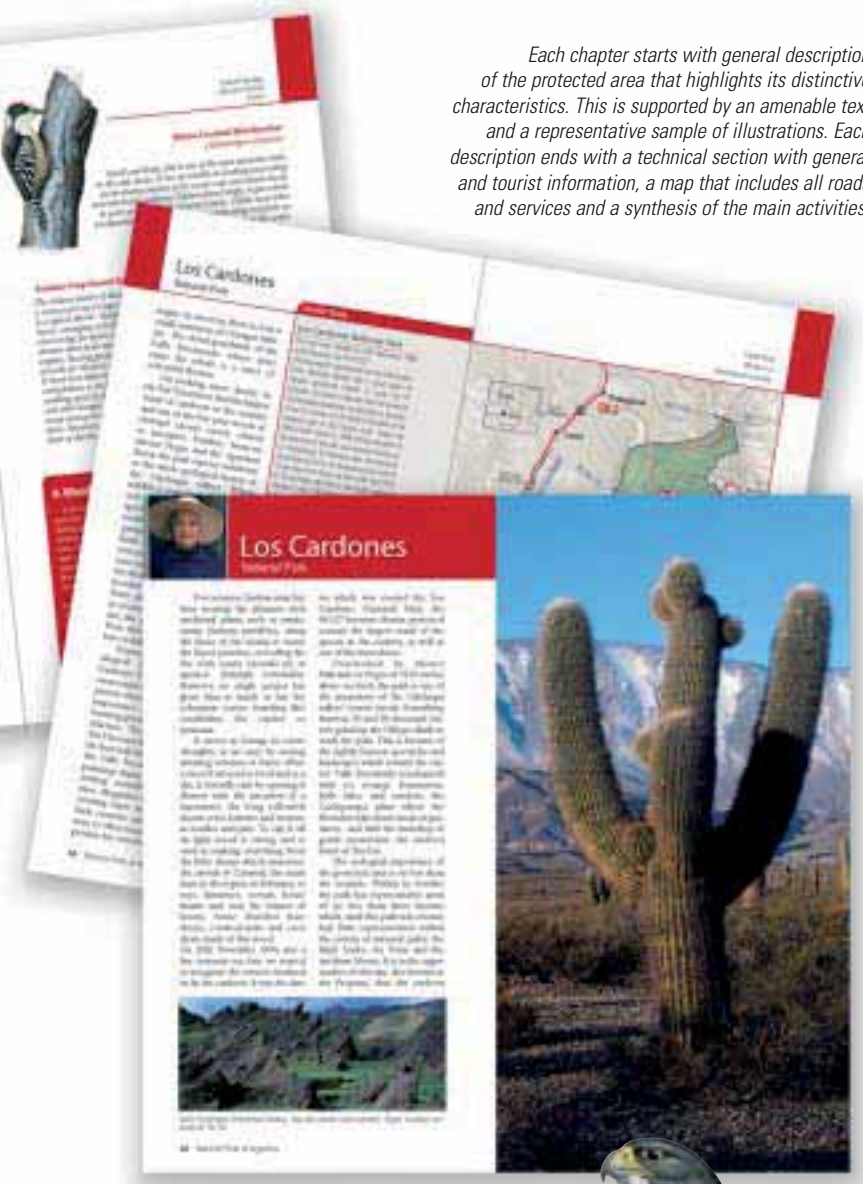
Mini-guides

There is a mini-guide for recognition of some group in each region aimed at interesting the visitor in some aspect such as tracks, birds, constellations or flowers.

Any tracks found can be measured using the scale printed on the back flap.

Four spectacular explanatory diagrams help reveal the secrets of the rainforests and the Yungas, the Iguazu falls, Sierra de las Quijadas and the Perito Moreno glacier.

Each chapter starts with general description of the protected area that highlights its distinctive characteristics. This is supported by an amenable text and a representative sample of illustrations. Each description ends with a technical section with general and tourist information, a map that includes all roads and services and a synthesis of the main activities.



To facilitate use, the meaning of each symbol used is shown on the flap at the back of the book.

In the more important protected areas, detailed information is given about the more noteworthy flora, fauna and cultural assets.

Introduction

"For Present And Future Generations"

The legacy of Francisco Moreno

Francisco P. Moreno laid the foundation stone of our network of National Parks over a century ago. Since then the concept of these protected natural areas has changed substantially in harmony with the evolution of Argentina and the world.

Argentine history abounds in acts of disinterested generosity but few have borne the fruits or had the consequences of that by the "Perito" Moreno, scientist, explorer and our expert in the affairs of settling the border with Chile. In mid-1903, as an *"extraordinary reward"* for his services which were given voluntarily over 22 years, the National Congress awarded him *"twenty five square leagues of fiscal land in the territory of Neuquen or south of the Rio Negro"*. On the 6th November, for the purpose of their conservation as a "natural park", Moreno returned three of these leagues (7,500 hectares) to the Nation in the furthest corner of Nahuel Huapi. *"They contain"* he wrote *"the most interesting conjunction of natural beauty that I have seen in Patagonia"*.

In accepting this donation on 1st February 1904, the government of General Roca made Argentina the third country in the Americas

Main photo: Nahuel Huapi National Park.
Below: Francisco P. Moreno.

and the fifth in the world, to decide to set up a national park following the example of the United States, Australia, Canada and New Zealand. This was the foundation of the Parque del Sur (later Nahuel Huapi National Park) and the nucleus of our system of protected natural areas.

Moreno's aspirations started to take shape in the twenties with two initiatives on the part of President Hipolito Yrigoyen: the Parque Nacional del Sur (later Nahuel Huapi) and the purchase of 75,000 hectares around the Iguazu waterfalls destined to become a national park and military colony. But this took until the 9th October 1934 to get off the ground with the passing of law Nº 12,103, the result of tireless efforts on the part of the genial Exequiel Bustillo who created the Department of National Parks - today's National Parks Administration - and set up the system of management for the areas under his responsibility.

Architecture of an awakening

The mandate emphasized the protection of landscapes of *"extraordinary beauty"*, a concept in those times contaminated by the European concept, with snow, mountains and woods (remember that Nahuel Huapi was to be the *"Switzerland of the south"*). The administration in its turn was to enforce sovereignty in border areas through the development of tourism, and became, in Bustillo's words, *"a real instrument for colonization"*. It is not surprising then that in 1937 were added (to Nahuel Huapi and Iguazú) only areas in the Patagonian Andes region, with magnificent scenery (Lanin, Los

The legacy of Francisco Moreno

Architect Ernesto Estrada in front of the Civic Centre in Bariloche.

Alerces, Perito Moreno and Los Glaciares), stretching along the permanently simmering frontier with Chile. It little mattered that some of the lands were the property of the original communities such as the Mapuches of Paimún or Rucachoroi.

This foundational (or constructional) cycle had the virtue of avoiding the destruction by fire or clear-cutting (a habit in those years) of vast areas and stretches of the Patagonian Andes woods and the Paranaense rainforests. But the heavy stress on the conservation of those areas detracted from the responsibility of caring for other less prestigious eco-regions such as the Chaco, where the Forestal lumber company was busily destroying one million hectares of quebracho woods for fencing the pampas, for tannin and railway sleepers. This was the beginning of a representational imbalance that is still notable today.

Further, over time, the growth of those frontier towns that Parks had sparked, came into conflict with conservation. Their increasing demand for space and resources only provoked in National Parks the reaction of intransigent protectionism. Such an attitude saved the integrity of the system but generated a long-lasting estrangement between the parks and their neighbouring communities as well as the provinces, especially those that had been *National Territories* in Patagonia when the parks were set up.

Carlos Thays at the Iguazu waterfalls.

Río Pilcomayo National Park created in 1951.

Piecing samples together

In the mid-XXth century, under the first peronist governments the concept of national parks as representing samples of the natural areas of the whole country came to be accepted. This was stimulated by the general preoccupation with man's post-war capacity to transform vast areas. At great cost, experience was demonstrating that nature was not infinite and it became the objective to save at least a part of each eco-system from the voracity of *"progress"*. To this end were created El Rey, Río Pilcomayo and Chaco National Parks, to counteract the destruction of the Yungas and the Chaco regions that continued for forestry, agriculture and cattle. Also from this period is Laguna Blanca National Park, in another marginal area as far as European concepts were concerned – the Patagonian steppe.

The eagerness to complete a representative sample of each of our eco-diverse regions continued with a generous input of spontaneity. From 1960 to 1981 seven new areas were added to the network (Formosa, Tierra del Fuego, El Palmar, Baritú, Lihué Calel, Calilegua and Laguna de los Pozuelos). The Ranger Training Centre also came into being, specialist technical cadres were assembled, advances were made in understanding the biological heritage in the parks, and interpretation was added to the activities. In spite of all this, Parks' closed policy confronting pressures from the neighbours, aroused the provinces and the creation of new areas – only achievable with the approval of the province involved, became unfeasible. This was to such a degree that the last incorporations of this period (Calilegua and Pozuelos) were decided by the military without the consent of the locals.

The legacy of Francisco Moreno

A new concept

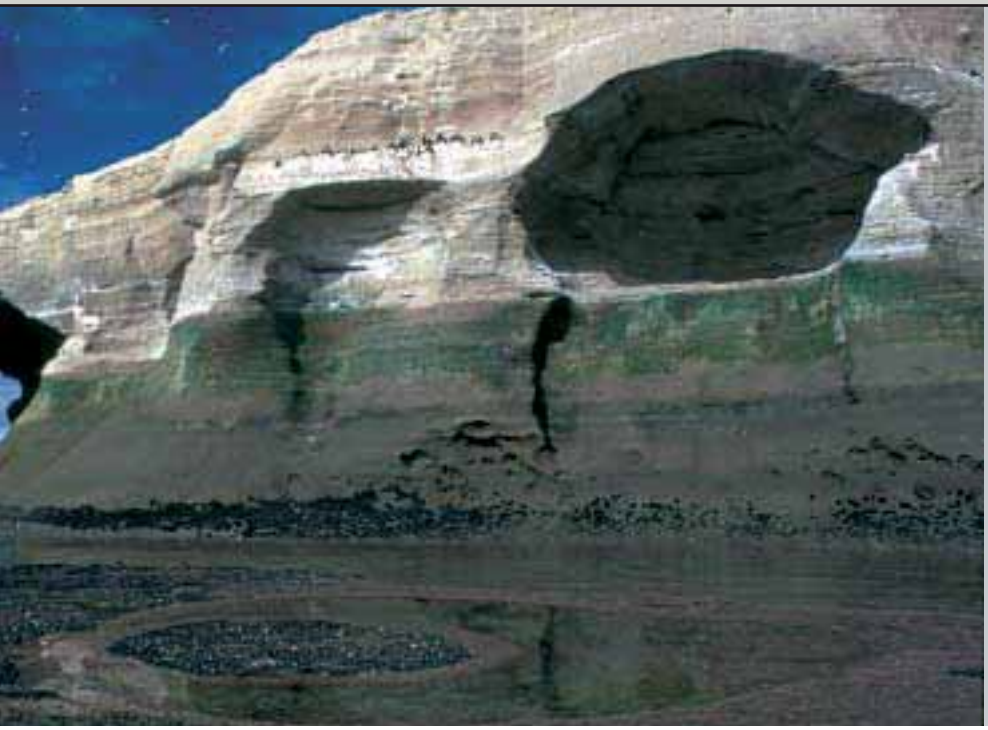
When democracy returned, the reigning ultra-protectionist philosophy ceded to a more integrated vision. Under this influence the conservation units ceased to see themselves as simple refuges for threatened species or opportunities to offer the enjoy nature. Their important role as genetic banks emerged, as also their role as guarantors of essential services for the quality of human life and economic development, as fields for scientific research and laboratories for models of sustainable development. In this way the importance of Parks began to be recognized by the local community. Dialogue gradually replaced confrontation in dealings with the provinces.

Since 1990 National Parks has been able to recover its foundational vigour. Fourteen areas have been added to the system: Otamendi, Colonia Benítez, San Antonio, Sierra de las Quijadas, Pre Delta, El Leoncito, Campo de los Alisos, Mburucuyá, Los Cardones, San Guillermo, Talampaya, Quebrada del Condorito, Copo and Monte León. Further, the Bosques Petrificados Natural Monument has sextupled its size, Lihué Calel National Park has tripled in size, and Pizarro Natural Reserve will soon be added to the system, a key connection between the Yungas forests and the Dry Chaco. All this totaled 1.003.208 hectares (50 times the size of Buenos Aires city), a significant increase in the environmental representativity of the National System of Protected Areas. The first samples of the Northern Monte, the Ibera Marsh complex, the Parana Delta, the Pampas and the Patagonian coast have all been added.

Monte Leon, first coastal-marine park in Argentina.

These were not the only improvements in the system. In 1996 Regional Technical Delegations were created and thus the national Parks Administration started a healthy programme of decentralization. At the same time Parks assumed responsibility for the study and conservation of the cultural resources within its jurisdiction, thus annulling the existing senseless separation. Further, forums were established with settlers, neighbouring localities, provinces and conservationist NGOs as well as co-management in the Yungas ecological corridor and Lanin National Park with the indigenous communities.

The present administration seeks to intensify these policies, especially in the sphere of the link between protected areas under its



control and the local, regional or national community, through agreed management policies, models of sustainable development that respect the existent cultural diversity and active participation of the social actors that will guarantee their commitment to the cause of conservation of natural and cultural heritage and community control in the process of making of decisions. One of the central aims of present policies is the contribution towards pockets of poverty and marginalization that are a reality in certain of our protected areas, without losing sight of the conservation mandates.

In this way it is hoped that the National System of Protected Areas will, by the end of the decade, cover not less than 5% of the national territory (today it is 1.3%), with a complete representation of the ecological diversity. For this to happen there is much to do; even the updating of current legislation. Today we can be proud of a concept of national parks charged with reality that places social considerations in the centre of conservationist actions. In the end, as Barry Commoner says in his **Ecology and Social Action**, "Whenever any environmental problem is analyzed for its root causes, an uncontestable reality emerges: that the root of the problem is not found in the ways man interacts with nature, but rather in the ways he interacts with other men; that to solve the environmental problem we must first tackle the problems of poverty, social injustice and war; that our debt to nature, the yardstick of the environmental crisis, cannot be paid by one person at a time recycling bottles or assuming ecologically reasonable habits, but in the old coin of social justice. In the end, peace between men must precede peace with nature".

Eco-regions of Argentina

Argentina is one of the countries with greatest bio-geographical diversity in the world. From sub-tropical rainforests to the Antarctic, from Andean heights to the Atlantic, there are eighteen natural regions or eco-regions. Amongst them there are five that are exclusive (or almost so) to the country. The basic mission of the National System of Protected Areas is to preserve representative samples of each of these, the fabulous environmental mosaic.

High Andes

From the Bolivian border to the north of Neuquen province, Andean heights cover some 14,300,000 hectares. They suffer an extremely dry climate, cold and with ferocious winds. The most characteristic plant communities are of tough bunch grasses such as Stipa sp (coirons) that cover the less steep slopes. Even higher the vegetation is impoverished to the point of disappearing altogether, as if swallowed up by the rock. In contrast, little valleys and depressions where water from snow-melt gathers, are amazingly green. Amongst other species, the mountain vizcacha, red fox and the Andean condor exist on these meager provisions.

Puna

This is the second largest high plateau in the world after Tibet (averaging 3.800 m in elevation). Its 8,640,000 hectares stretch from Jujuy province to the north of San Juan. They are dotted with salt pans and shallow saline lakes. These bodies of water attract an impressive array of water-birds amongst which our

three species of flamingos are the stars. Around them grows the typical vegetation of the region - steppe, of low bushes that troops of the unhurried vicuñas and Puna rheas wander through. Polylepis is the only tree of the Puna, flourishing in the shelter of ravines and steep slopes where it finds greater humidity.

Northern Monte (Hills and valleys)

The name is misleading. It is not what is locally referred to as "monte" (woods), but a scrubby steppe covering inter-montane valleys, hollows and hills. The 11,710,000 hectares run north-south, parallel to the Andes from Jujuy to northern Mendoza province.

Rainfall is scarce (up to 200 mm annually). However, where there is reachable underground water certain species of tree grow (mostly Prosopis – a mesquite cousin). The wildlife of this exclusively Argentine region includes the guanaco, a land tortoise, puma, plains vizcacha, lesser fairy armadillo, the boa constrictor and the crowned eagle.

Yungas Forests

These are the southern end of the swath of forests that stretches down from Venezuela along the eastern slopes of the Andes. Like a luxuriant wedge, the 4,661,000 hectares of Yungas divide the Puna from the Chaco woods, covering various side ranges of mountains. The heights catch the humid winds from the Atlantic and draw from them the 900 to 2,500 mm of rain that fall each year. These slopes thus grow the intricate eco-system that competes with the Paranaense rainforests for biodiversity, and performs a fundamental service in regulating the provision of water in our north-west. The eco-region has many exclusive species of fauna such as the alder parrot and a red squirrel.

Dry Chaco

This occupies the greater part of our Chaco plains and slopes that contain it to the west and south. The 49,298,000 hectares are covered with an interminable succession of thorny, dry woods, occasionally interrupted by patches of grassland, groves of columnar cactus or, in the south, some salt-flats. The emblematic tree of the region is the Santiago red quebracho, impressive in its majesty and, as the Spanish name implies, of a wood that is capable of breaking axes (Quiebra – break; hacha – axe). The threatened jaguar finds refuge here, already vanished from the Wet Chaco to the east, as do two living fossils, the giant armadillo and the cactus peccary.

Wet Chaco

Its 11,850,000 hectares back onto the rivers Parana and Paraguay. It enjoys the enriching proximity of the Misiones rainforests and a generous regimen of rains of up to 1200 mm per year. Not surprising that this then contains the greatest biodiversity of the Chaco plains, nor that it is only surpassed by the Yungas and Paranaense rainforests.

The landscape is one of thick woods, palm-dotted savannah, gallery forest along the few watercourses, marshes and lakes. This

Eco-regions of Argentina

MAPA: APN

varied mosaic of habitats is home to boas, caymans, monkeys, brockets, capybaras, peccaries and an infinity of water-birds.

Sub-Antarctic Woods

These Patagonian Andes woods have existed for millions of years in the latitudes of westerly winds where the humidity from the Pacific is dumped on the mountains. It is a narrow strip from Neuquen to Tierra del Fuego and Staten Island. Many of the plant species, especially the dominant southern beeches, have close relatives in Australia, New Zealand and even in fossils found in Antarctica. The explanation is in the now remote union of the southern continents. The Sub-Antarctic Woods are not noted for their biodiversity but they are home to abundant endemisms. Amongst these is the smallest deer in the world.

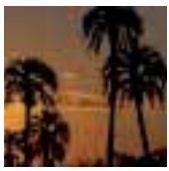
"Campos" Scrub Savannah

This is a broad band of grasslands with scrub. Occupying 2,768,000 hectares in the south of Misiones and eastern Corrientes province, between the Paranaense Rainforest and the Espinal woods. The monotony of the habitat is broken by occasional copses (locally known as "mogotes") and the gallery forest that follows the courses of rivers and streams. With its humid subtropical climate it grows an interesting variety of herbaceous plants where arrow-grasses, esparto-grasses and Jesuit grass dominate. The fauna is made up of species from the Paranaense and the Chaco.

Delta and Islands of the Parana

This vast mosaic of wetlands does not only cover the labyrinth of delta channels and the islands that hold up the turbid waters of the Parana and Paraguay rivers. It also includes the floodplains of these rivers and part of the River Plate's estuary. Its 4,825,000 hectares form a wonderful biological corridor. Favoured by the waters that provide humidity, temper the extremes of temperature and are a means of transport, many Chaco and Paranaense species can exist in these southern latitudes. There, on alluvial sediments, they support one of the most singular habitats on the planet: the Parana Delta, a subtropical wedge that splits the Pampas plains in two.

Espinal



This is the crescent of woods that encloses the Pampas Grasslands. It is composed of woods of thorny species of tree –typical of drier habitats- that alternate with savannah, grassy steppe and palm groves. Some consider this an impoverished Chaco with fewer species and lower trees, but the preponderance of Prosopis species gives it its own particular personality. The 29,740,000 hectares run from warm and humid Meso-potamia to the thirsty region in central La Pampa and the south of Buenos Aires provinces, on gently undulating plains. This eco-region shares its wildlife with its neighbours.

Patagonian Steppe

The 53,446,000 hectares descend from the Andes mountains to the

Eco-regions of Argentina

Atlantic coast down a series of steps. North to south the eco-region runs from the volcanic south of Mendoza province to the grasslands of northern Tierra del Fuego. Mostly it is covered by scrub and sparse grasses that

are adapted to the severe reigning conditions of poor soils, low rainfall (less than 200 mm per year), low temperatures (to –18°C), frosts nearly all year and winds that often rage at over 100 kph. The eco-region shares species and genera with the Puna and High Andes but is noted for the number of endemic species found there.

Ibera Marshes

Eight thousand years ago, before taking to its present course, the great Parana river wandered undecided across central Corrientes province. The track left by its changing opinion is the system of the Ibera Marshes, a shallow depression of 3,793,000 hectares where open water, marshes and swamps are all interspersed. This must be one of the greatest reservoirs of fresh water on the planet. Up to 1,500 mm of rain fall each year. Much of this returns to the sky. Some flows towards the middle Parana down the Corrientes river, the principal overflow for

the vast marsh. The rest, in this hot climate, supports a torrent of vegetation of reeds, underwater grasses and floating islands (embalsados). Equally prodigious, the fauna includes such vulnerable species as the maned wolf and the marsh deer.

Islands of the South Atlantic

This natural region covers the Malvinas archipelago, South Georgia and the South Sandwich islands. Rocky terrain is covered with grass in many places, scrubby steppe and in saturated areas, peat bogs. The region's flora has some affinities with the southern Andes in spite of the lack of trees, and a fair number of exclusive species. The two regions also share species and genera of land fauna. But the most notable role played by these islands is as

breeding grounds for sea mammals and sea-birds. South Georgia, for example, is home to vast colonies of elephant seals, fur-seals, king and macaroni penguins.

Southern Monte (Plains and table-lands)

As from Mendoza province, the Monte takes a swing towards the Atlantic and separates the Calden woods of the southern Espinal from the Patagonian Steppe, not stopping till it reaches the sea in extreme southern Buenos Aires, Rio Negro and north-east Chubut. It is the most arid stretch

of Argentina, but here the landscape loses all its abrupt relief, these being plains and descending plateaus. It also loses species of flora, sufficient in itself, according to ecologists, to be a distinct eco-region. It covers some 35,331,000 hectares of creosote-bush habitat inhabited by antelope-like Patagonian cavies, pumas, guanacos, foxes and rheas.

Pampas Grasslands

This is one of the world's most fertile plains, covering 39,133,000 hectares. Its vast horizontality is only interrupted by the Tandil hills and Ventana outcrop of mountains in the south. A bare handful of slow and meandering rivers winds across it but it is speckled with thousands of lakes, ponds and marshes, sometimes in series. Benign temperatures and well-distributed rains reign throughout the year and the deep, rich soils have made Argentina one of the "bread baskets" of the world. Formerly it was one vast uninterrupted sea of grasses, completely treeless save in some marginal areas. Sarmiento, in his book *Facundo*, described it as "the sea on land".

Paranaense Rainforest

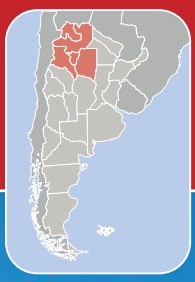
This is the region with the highest biodiversity in the country. Over 2000 species of vascular plants are believed to grow there, where live over one thousand species of vertebrates. This is not due to fertile soil (it is not, being lateritic) but to constant warmth and high humidity from the Atlantic winds and its sub-tropical latitude. Of the characteristic animals, the jaguar is the most noteworthy, and the harpy eagle, bush dog and dwarf brocket. Originally this biome covered one hundred million hectares in southern Brazil, eastern Paraguay and north-east Argentina. Today all but 5.8 million have gone. The best preserved nucleus is in our Province of Misiones.

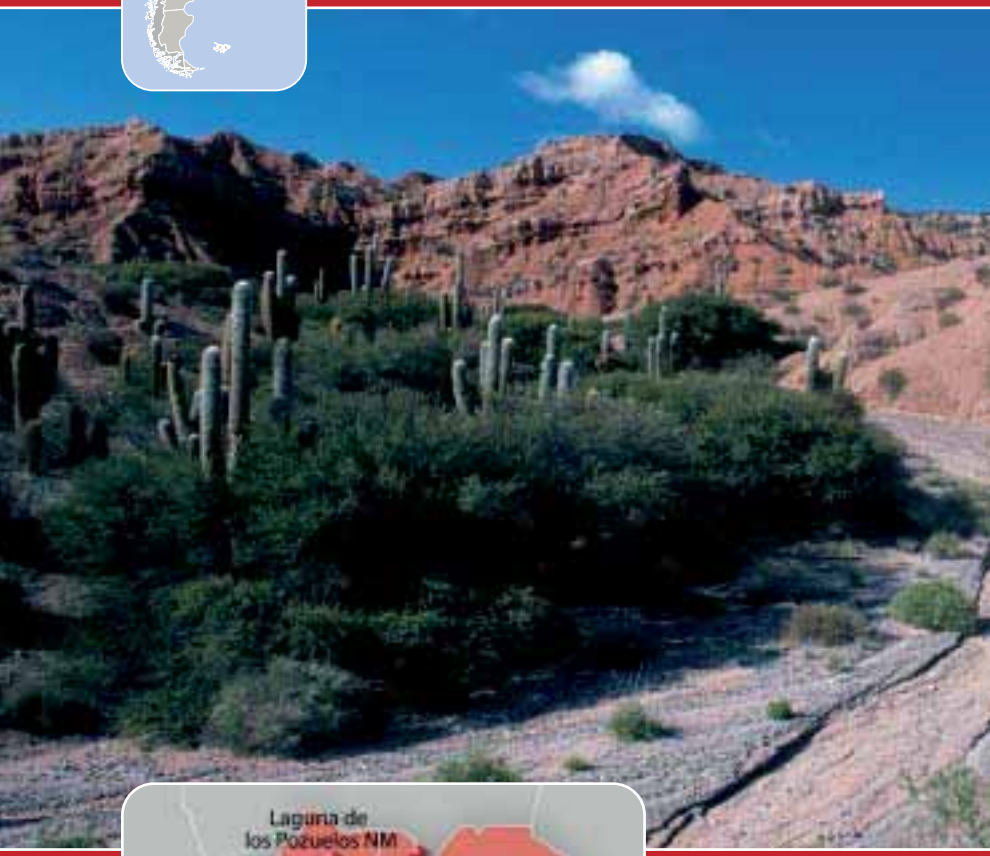
Antarctica

The portion of the White Continent claimed by our country includes the South Orkneys, South Shetlands and a great part of the Antarctic peninsula. There, due to the rigors of the environment, plant life is reduced to lichens, mosses, algae and two species of vascular plant. Something akin corresponds to life on land – a mere handful of invertebrates. Marine life, on the other hand, reflects the excesses of the continent. The blue whale, largest animal ever to have lived, is the best example. Also the elephant seal – the largest seal, the orca – fastest being in the sea, the wandering albatrioss – worlds largest wing-span and longest incubation.

Argentine Sea

This eco-region includes both the waters that cover the continental shelf and the litoral strip. The biological importance is reflected by the economic. On the Patagonian coast there are numerous breeding colonies of sea-birds and mammals (amongst them the Magellanic penguin and the South American Sea-lion). Just off-shore are vast forests of giant kelp – fronds hundreds of metres long – and the southern right whale that finds protected waters for breeding, such as the gulfs by Valdes peninsula. Out at sea the high concentration of plankton is the life support for 300 species of pelagic fish, the basis of a fabulous fishery resource.





Laguna de
los Pozuelos NM
Jujuy
Baritú NP
Calilegua NP
Salta
El Rey NP
Los Cardones NP
Copo NP
Tucumán
Campo de
los Alisos NP
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El Rey
National Park

It is not only the province of Misiones that contributes tropical green to the map of Argentina. There is also forest in the northwest - a wedge penetrating from the north, astride the sub-Andean ranges, the Calchaqui peaks and the Aconquija sierra, between the high Puna and the Chaco woods. From Bolivia this penetration extends some 700 kilometres and gradually disappears in the province of Catamarca. This is the southern extremity of the type of forest which grows on the eastern slopes of the Andes from Venezuela southward. Ecologists call it the Yungas or Sub-tropical Montane Forest. Together with the rainforest of the Paranaense it shares the lead in biodiversity within the country.

For two centuries before becoming the first national park in this eco-region, El Rey was a working cattle farm. In the mid-XXth century it was bought by a lumber company and the forests began to yield up colossal "cedars" (*Cedrella sp*) and laurels. Fortunately the clamours raised in defence of the area were heard. The peronist government was at that time seeking to conserve samples of our more eminent ecosystems and include a complete sample of these in protected areas; until then only the Patagonian Andes and the Misiones rainforests were represented. When it came to choosing an area in the NW forests, all studies withoput exception pointed to El Rey. Finally, in 1948, the 44, 162 hectares were claimed by National Parks before the axe had affected more than a small area; the cattle-hands became the parks first rangers. Thus the area bubbling with life and of important historical and literary significance (see page 30) was saved for posterity.

El Rey is contained by the Cresta de Gallo range of mountains to the west and the Piquete range to the east. It can be likened to an amphitheatre overflowing with vegetation, where the stands rise up to some 2000 metres on the ridges. On the outside the slopes are precipitous, turning the whole into a type of walled city. Only one narrow pass gives acecess to the sanctuary at a rolling bottomland valley where

Los Lobitos cascade. *Left:* Arroyo Quina. *Top left corner:* Epiphytes. *Top right corner:* Red-legged Seriema.

El Rey
National Park

stood the Sala - the Salta denomination for farm homesteads - and where the park HQ are sited today.

In this sector the area of dry Chaco woodland dominates with trees such as the algarrobo (*Prosopis sp*), tala (*Celtis tala*), Condalia and the chañar with its peeling bark (*Geoffroya decorticans*). Elements of the forest proper here are but a lonely cebil (*Piptadenia macroptera*) or viraro (*Ruprechtia sp*) growing on the knolls. As elevation increases the Yungas gradually take over and as from 800 metres above sea-level the vegetational stratae begin their climb up to the peaks (see pp 30 and 31). This forest mass, densely vegetated with bromeliads, climbers and lianas, lichens and fungi, is vitally important to the region's economy by regulating the distribution of the 1200 mm of precipitation that fall during the hotter months of summer. By guaranteeing a constant flow in the streams which drain into the Popayan river they ensure a dependable source of water for irrigation east of the park. Had the forests been removed, these streams would flow torrentially for brief periods during the rainy season, causing destruction and washing away the soil. Thus winter would be a thirsty time of want.

El Rey is the only national park in the Yungas region with a good representation of the Chaco woods. This intrusion has not only enriched the variety of habitats within the park, but afforded greater opportunities for the viewing of wildlife. Here, within the ring of mountains, life itself seems to pulse with greater strength.

Useful Data

El Rey National Park

The park was created on 14th July 1948 by National Decree Nº 18.800.
It is in the Yungas eco-region with a sample of the Dry Chaco and covers an area of 44,162 hectares.
The name of the park comes from the original farm's name dating from 1767, which was ceded "*by the grace and royal favour*" (Rey means king), to Colonel Juan Adrian Fernandez Cornejo.

Points of interest include the area known as Santa Elena and Los Lobitos waterfall, 4 km from HQ along a vehicular road; Popayan river, 10 km along a rough road, sometimes very difficult; Pozo Verde, an uphill hiking trail 12 km long; Los Loros waterfall, 10 km of steep and, in places, difficult hike; Los Patitos lake, 1.5 km before HQ by the road in to the park.

How to get there: From Salta or Tucuman take national route 9 to Lumbreras, then east along provincial rt 5 to Paso de la Cruz and north along rt 20 to the park entrance. This is 197km from Salta or 387 from Tucuman. To either of these cities one can travel by bus from all over the country; or one can arrive in Salta or Tucuman on the daily flights from Buenos Aires or Cordoba. To reach the park rent a car, take a chauffeur driven remis or contract an excursion through a travel agent. The nearest public bus-route is through Paso de la Cruz, 48km from the park.

There is no entry fee charged.

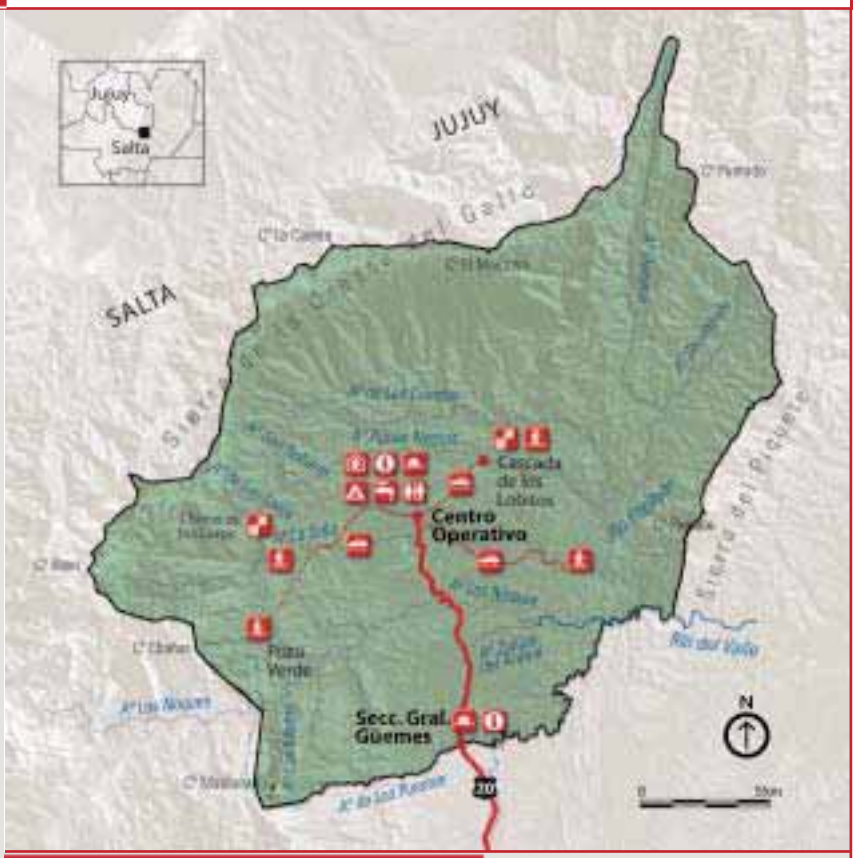
Lodging, meals and fuel: there is but one camping area within the park, by HQ, where there are tables, fire-sites, bathrooms, water and electric light. One must bring all necessities and fill up with fuel on rt 9 (Metan – S of Lumbreras) or Juramento (N of Lumbreras). Metan also has hotels, restaurants and supermarkets.

The climate is montane sub-tropical with a dry season in winter. Average winter temperature is 8ºC, in summer 21ºC. The annual rainfall is around 1500mm in the hills. There are frosts in winter and some snow is registered on the peaks.

The best season to visit the park is in winter and early spring. Route 20 becomes impassable at times during the rains.

Apart from the splendid city of Salta, nearby attractions include the historical Posta de Yatasto where Generals San Martin and Belgrano met, and the Rosario de la Frontera thermal baths, both on rt 9, 131 and 157km south of the park respectively.

Further information is to be had from the park's office in Salta
España 366, 3rd floor - 4400 SALTA
Tel (0387) 4312683
e-mail elrey@apn.gov.ar



Recreational Activities

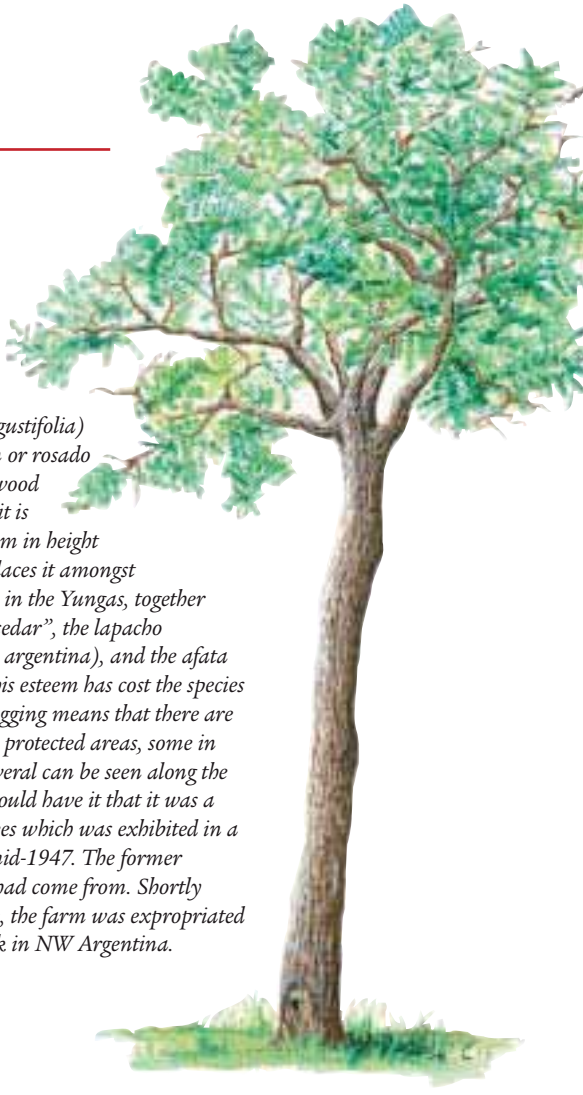
Hikes and wildlife watching

From the park's HQ trails lead to Santa Elena and the Los Lobitos waterfall, to Popayan river, Pozo Verde, Los Loros waterfall, and other splendid places. Years ago these trails captivated visitors to the farm, including the writer Ricardo Güiraldes; today they are walked by people from all over the world. Some can be visited without getting out of the car; others invite one to stroll or hike, such as the Pozo Verde trail, reaching a pond covered with tiny floating plants and surrounded by magnificent vegetation; it is at the end of the 12km trail through the various types of forest where one can see toco toucans, peccaries and capuchin monkeys.

Chachalacas, brockets and crab-eating foxes are more usually encountered in the lowland trails and roads, in the mesquite woods. As well as a refreshing dip, the transparent waters of the Popayan river offer the spectacle of schools of several species of fish amongst which are catfish and "dorados". Dusky-legged guans and red-legged seriemas are so used to humans that they are best seen around the campground and HQ. On the entrance road, only 1.5km before reaching HQ, the Los Patitos lake is a delight for bird-watchers.

El Rey
National Park

Species of Values



The Salta "Cedar"
(Cedrela angustifolia)

The Salta "Cedar" (Cedrela angustifolia) which is also known as the Oran or rosado (pink) "cedar" has a beautiful wood which is used in fine carpentry; it is one of the colossi and reaches 25m in height with a diameter of 1.7m. This places it amongst the more valuable species of tree in the Yungas, together with its relative the Tucuman "cedar", the lapacho (Tabebuia sp), the "roble" (Ilex argentina), and the afata (Heliocarpus popayanensis). This esteem has cost the species dearly - decades of thoughtless logging means that there are few grand specimens left outside protected areas, some in inaccessible places. In El Rey several can be seen along the trail to Pozo Verde. Tradition would have it that it was a gigantic trunk of one of these trees which was exhibited in a rural show in Buenos Aires in mid-1947. The former president Peron asked where it had come from. Shortly thereafter by presidential decree, the farm was expropriated to become the first national park in NW Argentina.

Stories from the farm

In the mid-18th century Colonel Juan Adrian Fernandez Cornejo who was a descendent of the Inca Tupac Yupanqui, was given lands on the "frontier" of the Rio del Valle for his services to the Spanish crown, amongst which figured a pioneering descent of the Bermejo river and several exploratory excursions into the untamed Chaco Gualamba.

This was the beginning of the El Rey farm which at first was but a fort where the lush grasses of the rolling lowlands fattened the cattle of the soldiers stationed there to oppose the incursions of the tribes of indigenous people. After many years and through the whims of history, Güemes and his guerilla forces found refuge in the thickets, while later still, the farm became famous for the strong horses bred there.

However, the place was best known through one of its frequent visitors, the writer Juan Carlos Davalos, the author of "Viento Blanco" and a relation of the descendents of Fernandez Cornejo. The wild scenery of El Rey and the exploits of the courageous gauchos inspired some of the best tales of this author from Salta. It is no coincidence that in 1945 Davalos was active in defence of the "prodigious region" and this "splendid living museum of the tropical area" from the axe. Three years later the creation of the park meant that his writing did not become the elegy of a lost world.

Tapir *(Tapirus terrestris)*

The Tapirweighs in at around 300 kilos and is over a metre tall at the withers, which makes it the largest native land mammal of the South American continent. It has characteristics of several other animals - elephant, ox, pig and mule ("it looks like a monster made up of other species" say the chronicles of Pedro Lozano). Is it surprising then that the Spaniards called it the "Great Beast" though it was known as tapir to the Tupi-Guaranis? Or that it is classed with the rhinoceroses, another enigmatic group.

Toco Toucan
(Ramphastos toco)

The Toco Toucanis the largest of the family and abundant. It is equally at home in the Yungas, the Wet Chaco and the Paranaense Rainforests. These forests offer it all it needs - nest-sites, food and shelter, so it does not have to move very far - in fact the short and rounded wings carry it only in short flights through the woods. The enormous bill is not a hindrance as its interior is hollow and strutted for lightness. With this appendage it can reach for fruit, delve into deep nests and defend itself effectively through intimidation of its assailants.

Land of Men

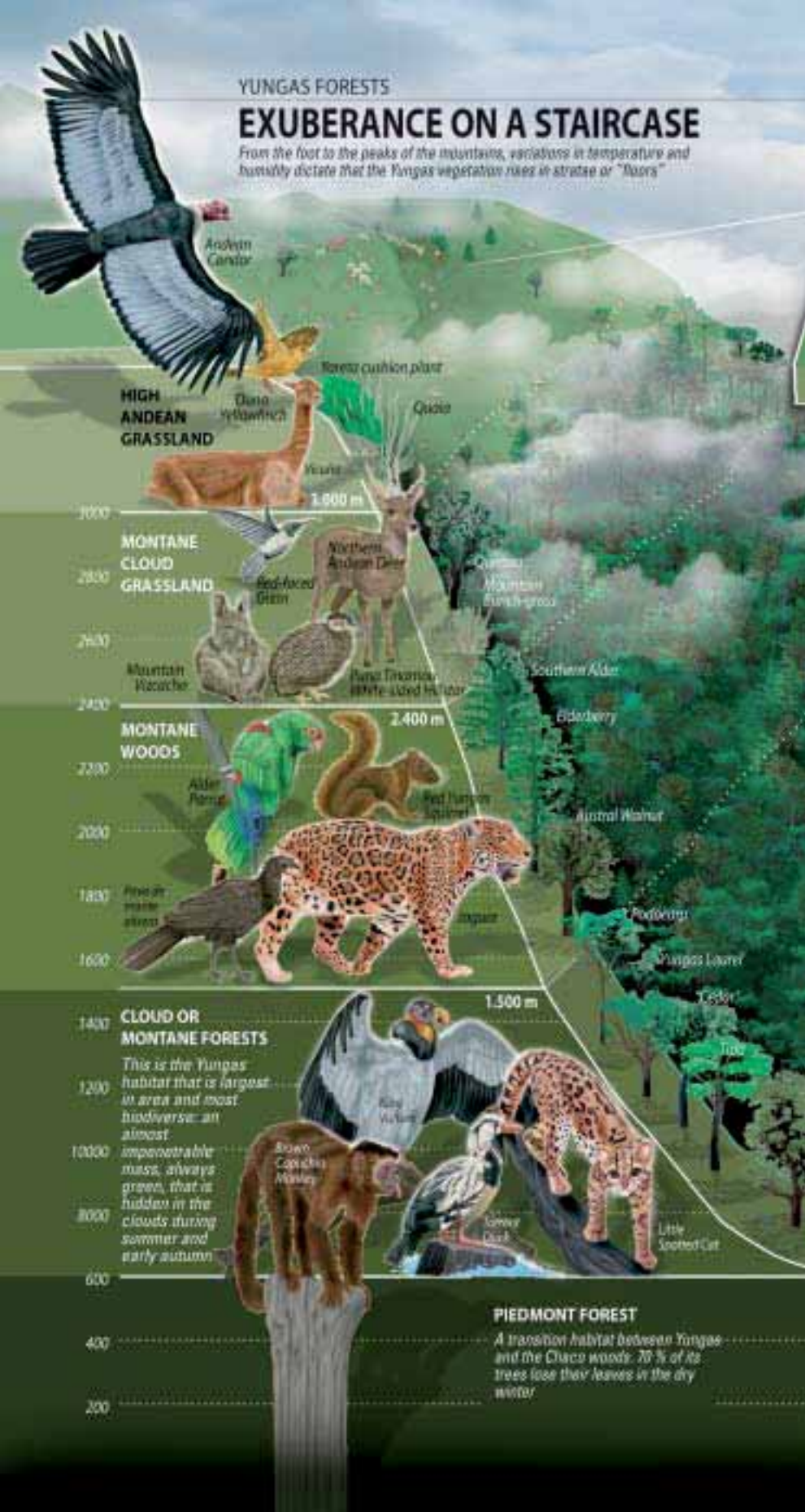
In the woods (*En el Monte*), a vigorous tale told by Davalos, relates how a brave little farm-hand sets out to slay the jaguar that killed his favourite dog with but his lasso for his weapon. The tale is based on a real event and the hero - Martin Madrid - was in fact Guillermo Alzogaray. Over the years he became a famour hunter of jaguars and one of the outstation hands at El Rey, in charge of a section.

Hipolito Alzogaray, a nephew of that brave man, had an equally well-known life though completely opposite, and became the Head Ranger of the national park, a responsible position never before held by a local ranger. His sons Alvaro and Angel followed his lead and are today rangers in the parks system. Between the jaguar hunting Alzogaray and the professional park rangers who bear the same surname, is reflected the transition between the traditional farm and the first national park in NW Argentina.

YUNGAS FORESTS

EXUBERANCE ON A STAIRCASE

From the foot to the peaks of the mountains, variations in temperature and humidity dictate that the Yungas vegetation rises in stratae or "floors"



Montane Grasslands

SHEPHERDS IN THE CLOUDS

The inhabitants of the Yungas mountains grow maize, potatoes, pumpkins, peppers, pea-nuts, and a root crop called yacón (*Polymnia edulis*). But they are basically breeders of cattle and sheep. In summer they let their animals wander over the grassy uplands and as hard winter sets in they drive them down to the upper forests. They use fire to maintain or increase pastures and bring on early sprouting. This practice has, over decades, pushed back the montane forests in certain areas. But today the process has reverted. Benefited by climate change, the southern alder is taking over much grassland.

Montane Forests and Woods

A WONDERFUL SERVICE

By protecting the headwaters of mountain watersheds, the Yungas forests guarantee a regular provision of water to over two million people and hundreds of thousands of irrigated hectares of cultivation in Salta, Jujuy, Tucuman and Catamarca provinces. Further, ten species of trees of timber value grow there, as do over one hundred plants that the indigenous communities use for food, as medicine, fire-wood and raw materials for manufacturing their handicrafts.

Piedmont Forest

COMING TO AN END

The piedmont forests, where 30% of the Yungas' biodiversity exists, is the habitat that is most threatened in Argentina.

Once it covered 1,500,000 hectares

Since the end of the XIXth century 900,000 hectares have gone under the plough with the advance of the agro-frontier.

90% of the remaining 600,000 presents a high degree of deterioration thanks to extractive forestry practices, livestock and splitting up.

Clear-cutting continues today for pulp bean production, at a rhythm of one thousand hectares per year.

In a very few years, if deforestation does not stop, there will only be hopeless patches of this prodigious ecosystem left.

Roble

Nogal

Laurel del Cerro

Aguaribay

Pino del Cerro

Palo Blanco

Yungas Aerealdo

Urunday

Tucán Toucan

Milano Blanco

600 m

Baritú
National Park

Tucked up in the NW corner of Salta province, on the border with neighbouring Bolivia, Baritu is the northernmost of the four national parks which protect samples of the Yungas forests. In this position it is the nearest to the equatorial stands of these forests where humidity is higher, the heat more intense and there are more tropical species living - an unmatched biodiversity and luxuriance. Furthermore, it is a virtually virgin area. Surrounded as it is by ranges of mountains up to 6000 feet (2000m), with rivers and streams which in times of rain become torrents, it was never subjected to the advances of agriculture, lumbering and cattle. According to the experts there is no sample of these forests better conserved in the country.

In 1968 the "*incomparable variety of fauna*" and the "*prodigious thickets*" of Baritu captivated scientists of the Miguel Lillo Institute of the University of Tucuman. Three years later the university proposed that such a sample of nature be safeguarded as a national park: "*Some specimens which are considered great trees in the more southerly parks (El Rey) or in Tucuman would here be classed as saplings*" was the substance of the Lillo's report . The idea took root in the authorities of Salta as well as in National Parks, and under the signature of the President Juan D. Peron the law creating the park was passed.

Thus over seventy thousand hectares of virgin forest passed under federal protection. The emblematic species is the Chunta (a forest palm), gigantic specimens of the "cedars" (*Cedrellas*), a laurel (*Phoebe sp*), the gigantic stranger fig (*Ficus maroma*) which starts life as an epiphyte and later covers the host with its own hollow trunk, *Strelitzia regina* of gaudy colours resembling nothing as much as a toucan's bill (of the family of the bananas) and stands of primeval tree-ferns. In all these botanical curiosities live strange animals - fruit-eating bats, tree porcupines, frogs which carry their fertilized eggs in a fold of skin on their backs - equivalent of the kangaroo's

Montane forest. *Top left corner:* Ocelot.

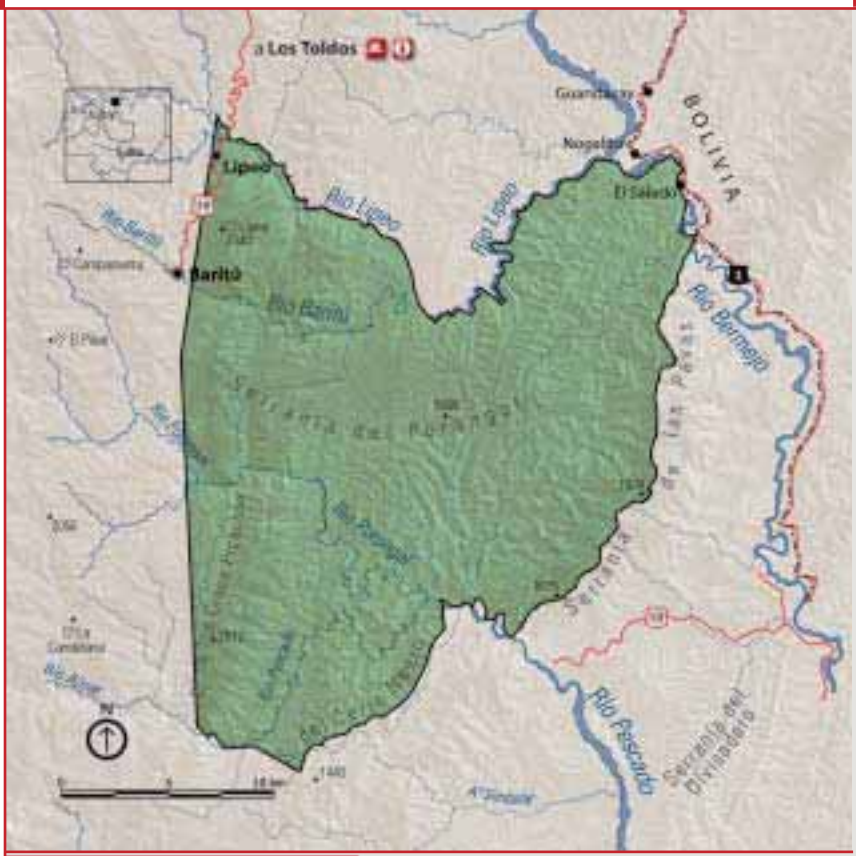
marsupium. It was believed that South America's only bear would be found in Baritu (see p. 37). This area, as well as being a refuge for strange beings, harbours species which are in danger of extinction - the military macaw, tapir and the jaguar ("*a very tigery area*" claim the locals).

Tourist visitation of the park is limited to the NW corner where Lipeo and Baritu hamlets lie. In the neighbourhood, within walking distance, are the Cayotal thermal waters, the splendid narrows on the Lipeo river, colossal tree-ferns and Cedrellas of over 2 m in diameter. The locality of Los Toldos where the park's HQ are located, is the stepping-off place for the future Los Nogales National Reserve - 8000 hectares of montane woods and upland grasslands where jaguars, otters, peccaris, squirrels, red brockets, northern Andean deer, guans, alder parrots and Andean condors are found.

Reaching these localities is not easy, but the effort is well rewarded: the chance of exploring unspoilt nature and meet the people who, living there over centuries, have learned to live from it without destroying the resources.

Baritú

National Park



Recreational Activities

Riding and hiking

The NW corner of the park offers captivating places for the intrepid visitor who is prepared to pack in a tent and provisions. The scattered settlements of Lipeo and Baritu where it is possible to rent a horse (and guide) are the jumping-off points for visiting the park. From one's first base camp, in a couple of hours one can reach the thermal springs on the Cayotal river an oportunity for a revitalizing dip. In just over three hours one reaches Campo Grande and the granite cliffs which squeeze the Lipeo river into narrows. From these narrows, some 9 Km from Lipeo, it is a short walk to the narrows on the Baritu, a band of amazing tree-ferns and the "cedar" woods called El Cedral. To undertake these outings, the tutelage of a local guide is an enriching experience where one gets to know and understand local traditions. The handicraft artisans at Los Toldos are also worth a visit for their weaving, wooden spoons and hollowed "cedar"-log troughs. For the thrill-seekers a rafting descent of the Lipeo river, but this is organized from Salta.

Useful Data

Baritú National Park

The park was created on 27th April 1974, under national law Nº 20,656.
It protects an area of Yungas forest, some 72,439 hectares.
The name of the park is from the neighbouring hamlet which acted as home base for the scientists in their various expeditions, and means "small settlement" in Quechua (huario – settlement, tu – diminutive).
Nearby points of interest are the thermal waters of Cayotal, Campo Grande and the Lipeo narrows all around Lipeo; Cedral "cedar" woods, giant tree-ferns and the Baritu river narrows around Baritu.
To get there from San Ramon de la Nueva Oran (just Oran for short) in the province of Salta drive along route 50 to Aguas Blancas on the border with Bolivia. After the paperwork of immigration, through Bolivia along a winding and picturesque stretch of the Pan-American Highway to La Maroma where a bridge over the Bermejo river leads back into Argentina to reach Los Toldos, the park's HQ's location, and neighbouring Lipeo. The 185 km can be covered in a car or in diverse means of transport – rented car (with driver) from Oran to Aguas Blancas; a long-distance bus on the Bolivian part from Pozo Bermejo to La Maroma, small bus to Los Toldos and then a neighbour's pick-up to Lipeo. It is also possible to contract the services of a travel agent in Oran, a city with bus connections from all over Argentina, or in Salta with daily flights to Buenos Aires and Cordoba.
There is no park entry fee charged.

Where to stay, eat or obtain fuel. The park has absolutely no infrastructure for receiving visitors. There is only the alternative of tenting in the park. Los Toldos has a municipal shelter where cabins can be rented, families recieve guests in their homes; there are places to eat, stores and a small hospital. Fuel is hard to come by so it is best to fill up at Oran or Aguas Blancas.

The climate is montane and tropical with a dry season. Temperatures vary from summer's 24ºC average to winter's 14ºC . Rainfall amounts to 1800 mm per year, nearly all in the summer months, so the best time to visit is between June and early October as the park is cut off during the rains.
A nearby place of interest to visit is the future El Nogalar National Reserve only one kilometre from Los Toldos.

For further information contact Baritu National Park,
Casilla Correo 05
4530 – San Ramon de la Nueva ORAN
Province of Salta.
Tel: (03878) 15401537, or e-mail baritu@apn.gov.ar

A living legend

The NW has its own "yeti" - the Uku, Ukumar or Ukumari. It is said to be ugly, with long, dark pelage, eyes like glowing coals, uncommon strength and a yell which frightens even the bravest dogs. Its habits include carrying off humans with a view to sexual assault.

This mythical creature has its origin in the Spectacled Bear (*Tremarctos ornatus* for the scientifically inclined), the only species of bear on the continent, known to those who speak Quechua as Ukumar. Its distribution is restricted to the Andean forests from Venezuela to Bolivia. The legend made people think that the species was once also found in Argentina and might still live in the more inaccessible areas of the Yungas.

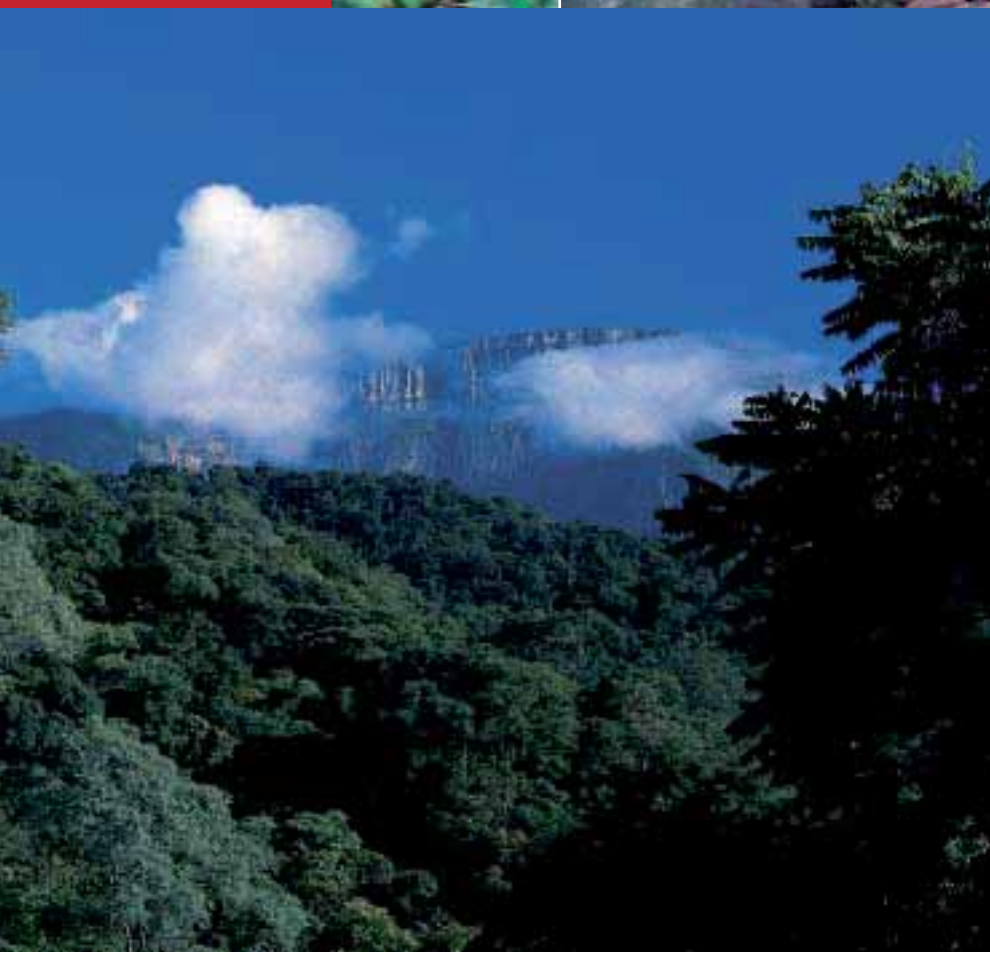
It has been recorded in the Bolivian department of Tarija which is just across the fordable Bermejo river from Baritu, but scientists have found no indisputable evidence of its survival today - except as a the legend. However settlers in the sub-Andean hills insistently claim that the bear - not the legend - still pokes its nose into their maize crops.

Calilegua
National Park

The mountains of Calilegua were uplifted with the Andes some twenty million years ago. Since then they have intercepted winds from the Atlantic and drained out their moisture. Thus the slopes are covered with an intricate cloak of trees, shrubs, lianas, climbers, bromelias and ferns.

In summer, the rainy season, this forest sponge protects the soil from the hammering of raindrops and withholds part of the rainfall. In the dry winter it milks humidity from the clouds in what is called *horizontal precipitation* and releases water gradually during this drought. In this way it manages to distribute, in a balanced fashion, the irregular contribution of the skies. Water is never lacking in the many streams that descend from the mountains to the San Francisco valley and its wonderful plantations of citrus, avocado pears and sugar cane.

On the protection of this system depends the prosperity of Ledesma, the most powerful agro-industrial complex in the country, and two towns that depend on it: Libertador General San Martín, and Calilegua, with some 85,000 inhabitants between them. It is



View from Mesada de las Colmenas. *Top left corner:* Little Bottle. *Top left:* Red Brocket. *Top right:* Aguas Negras stream.

not difficult to understand why, in 1978, the "company" donated the 76,306 hectares of mountainous terrain which today form Calilegua National Park. On the one hand they thus ensured nature's services for the long term, and on the other they transferred the cost of conservation of the area to the State.

Calilegua is the largest protected area in the Yungas forests. On its steep slopes grow some 120 species of tree (about one third - 33% - of all species growing in the country), 65 ferns (18.5%), 120 mammals (nearly 35%), 280 species of birds (28.4%) and an infinity of smaller life-forms. The inventory includes species of trees which grow to over 40 metres tall - the height of a thirteen storey building -, other life forms which are in danger of becoming extinct (northern Andean deer, the jaguar, black-and-chestnut eagle, the "palo blanco" tree *Calycophyllum multiflorum*, and so on) strange beasts such as the marsupial frog and the blue-crowned trogon which is related to the Central American quetzals,

Calilegua
National Park

magnificent orchids and the charming Yungas red squirrel and capuchin monkey. This variety attracts visitors from all over the world. Some, with binoculars at the ready and bird guide in hand seek only for a glimpse of the red-faced guan, the giant antshrike or other "difficult" species of the winged cast to see. Most however have a broader interest in wanting to get to terms with the exuberant Andean forests.

Calilegua offers a generous gamut of alternatives. At Aguas Negras, the entrance to the park, three hiking trails invite one to explore the dense vegetation, identify tracks, admire waterbirds or follow chattering streams (ten minutes to two hours of walking on easy to somewhat steep trails). But a few kilometres up the hill start more difficult trails into the more diverse habitats: Tataupa, La Junta, El Tapir (between four and five hours along more challenging trails where a licenced guide is required). From Mesada de las Colmenas, a balcony with magnificent view, one can reach the waterfall which lies at the confluence of the Negrito and Tres Cruces streams, a steep trail only to be undertaken with a guide, The very route 83, winding up through the park towards Valle Grande, allows for appreciation of the different vegetation types which grow in the Yungas, from the basal forest to the montane woods - drive, cycle or walk.

On the way the visitor can identify trees, birds or animal tracks, aided by the little guides one is given on entry into the park. With luck one might encounter the tegu lizard, squirrels, brockets or the crab-eating fox; what can be guaranteed are the spectacular views.

Useful Data

Calilegua National Park

The park was created on 19th July 1979 by National Decree Nº 1733.
It is in the Yungas eco-region and covers an area of 76,306 hecteres.
According to Guaraní oral tradidion, the name comes from *Ka-arireua* ("*possession of the forest*" or "*owner of the space*"). The Guaraní also allude to the name of the local chief Calilegua who is said to have leapt from the top of Cerro Amarillo so as not to surrender to the invading Spaniards. Andrés Fidalgo in his *Breve toponimia y vocabulario jujeños (Brief place-names and vocabulary of Jujuy)*, translates Calilegua as *rocky overlook*.

Points of interest include Aguas Negras at 450 metres above sea-level where there is a campground and walking trails; Mesada de las Colmenas at 1200 m, with a balcony offering a spectacular view, rest area and a trail; Monolito at 1800 m, the highest point on route 83 and where the route leaves the park. Call the park's HQ (phone 03886-422046) to contract licensed guides.

How to get there: provincial route 83, the road in to the park, starts to the left (west) from national route 34 some 120 km from the capital city of San Salvador de Jujuy, immediately after crossing the long bridge over the San Lorenzo river. From the neighbouring town of Libertador General San Martín, reached by busses from all over, a bus that traverses the whole of the park, headed for Valle Grande, departs at 8.30 a.m.; it returns in the afternoon (6.30 p.m. at Mesada de las Colmenas, 7.30 at Aguas Negras). One can also charter a taxi or rental car with driver (remis) from Lib. Gral. S. Martín, some 10 km from the park entrance, or from the provincial capital. There are daily flights from Jujuy city to Buenos Aires and Córdoba.

No entrance fee is charged

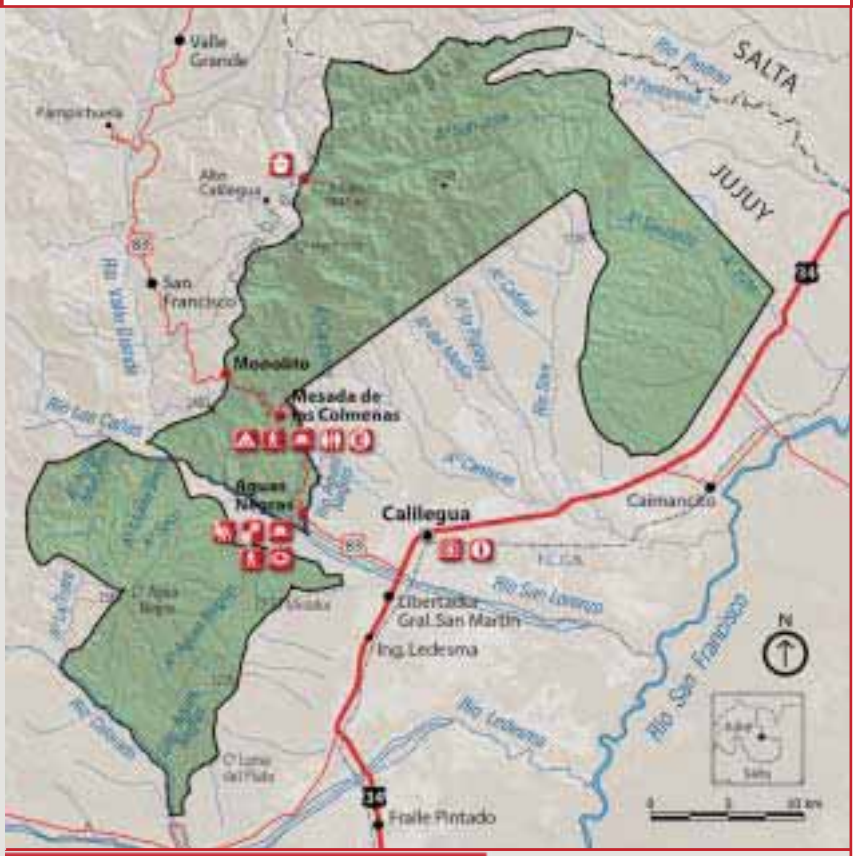
Lodging, meals and fuel: there is a camping ground with bathroom facilities, fire-sites and camp tables at Aguas Negras, the park entrance; a recreational area at Mesada de las Colmenas. Hotels, restaurants, stores and service stations are at Lib. Gral. S. Martín.

The climate is montane subtropical with a dry season in winter months. Average temperatures are 17ºC in winter, 28ºC in summer. Some 1900mm (70 inches) of rain fall annually, mostly between November and April. In the coldest months there can be snow at the higher elevations.

The best time to visit is winter and early spring. route 83 can be cut by rainfall in the wet season.

Nearby attractions include the thermal waters on the Jordán river at San Francisco, 15km beyond the Monolito where lodging and guides are available; thermal springs at Aguas Calientes, some 38km from Lib.Gral. S. Martín along national route 34 and provincial rt.1.

Further information is to be had from park HQ, San Lorenzo s/n, 4514 Calilegua, Province of Jujuy; phone and fax: (03886) 422046;
e-mail calilegua@apn.gov.ar



Recreational Activities

Cross-country

Mysterious ruins crown the Cerro Amarillo at 3646 metres above sea-level, the highest point in the park. Specialists maintain that they are of an Inca mountain sanctuary while local tradition claims nebulously that they are Jesuit ruins. To reach them one has first to climb, afoot or on mule-back the bridle path that goes from San Francisco (1478m) to Alto Calilegua (2400m) . Thence, if your legs are up to it, a steep climb up the Amarillo. There are no technical difficulties but it is a demanding slog. It is advisable to contract a guide in Alto Calilegua; the locals process up to the strange "walls" once a year, on Good Friday.

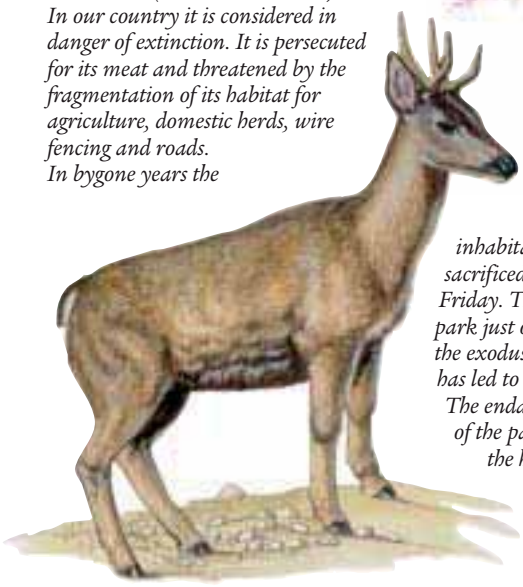
Another recommendable adventure is a long trek from Calilegua over into the Humahuaca valley which, since 2003, has been a World Heritage Site (UNESCO). This takes several days and passes through hamlets which have stalled in time, archaeological remains and spectacular vistas. Information is to be had from park HQ or from specialist travel agents.

Calilegua
National Park

Species of Value

Northern Andean Deer
(Hippocamelus antisensis)

One of the four species of fauna declared National Monuments. Stocky and tough as are all forms of mountain deer, it is 80cm tall at the withers and weighs some 65kg. It is found on high-Andean pastures between Ecuador and NW Argentina in small herds (3 to 14 individuals).
In our country it is considered in danger of extinction. It is persecuted for its meat and threatened by the fragmentation of its habitat for agriculture, domestic herds, wire fencing and roads.
In bygone years the inhabitants of Alto Calilegua sacrificed one of these deer on Good Friday. The creation of the national park just over the rim of peaks, and the exodus of the better marksmen has led to the shelving of the tradition. The endangered species, emblematic of the park, grazes unmolested on the high mountain pastures.



An urgent challenge

Thanks to the integral use of sugar cane, the agro-industrial giant Ledesma produces 20% of the sugar consumed within the country, 25% of molasses alcohol, 40% of the paper for printing and writing, without counting the millions of dollars value of their exports.

Their 35,000 hectares of sugar cane require something like 1500 mm of water annually for maximum yield, but the clouds seldom unload that amount on the valley (only thrice since 1946 according to rainfall statistics). The deficit is covered by irrigation using the outflow of the Calilegua mountains. There is no better example of the services that Nature offers production. It's important that the society values this faboulous contribution and committed in the conservation of the Yungas Forest.

Tarco o Jacarandá
(Jacaranda mimosifolia)

The wood of the jacaranda is easy to work and is used for fine furniture, panelling and carving which shows the lovely grain. However, it is outstanding as an ornamental species and this is hardly surprising: of elegant form it reaches 20m in height in but a few years and has two flowerings per year, the most abundant at the beginning of spring and before leaves appear; the ground around the tree is carpeted with blue bell-shaped flowers. Because of this it is a regular ornamental species in parks and gardens. In Calilegua it enhances the lower slopes.

The White-Spined Tree-Porcupine
(Coendou prehensilis)

This is one of the three species of tree-porcupines found in the country (the others are the black-spined - also from the Yungas - and the short-tailed from the NE). Its prehensile tail is a fifth limb for acrobatics in the trees of its forest habitat. The sharp spines - really just adapted hairs - are their efficient defence. They are released when touched. Enemies find that once stuck by spines, they are hard to get rid of because of the barbed points..

Hot frontier

Between 2600 and 1000 years ago two agro-pottery cultures (San Francisco and Candelaria) lived at the foot of the sub-Andean hills. They vanished without trace, perhaps wiped out by offensives of some forest people or from the Chaco.
At the end of the 15th century with the arrival of the Inca empire in our NW, the mountain chain became part of the eastern frontier of the Tawantinsuyu. The Incas installed there the subject groups from Bolivia such as the Ocloyas and the Churumatas - for the dual purposes of extracting precious metals and withstanding the advances of the warlike tribes from the Chaco Gualamba.

With the Spanish conquest the Inca *mitimaes* were brought down from their elevated positions and installed in the valleys to work on the farms of the royal grantees (encomenderos) and to be a buffer against the constant advances of the Chiriguanos and Guaycurús. Later the colonial authorities strengthened their position by building a string of forts, such as that at Ledesma or the one in El Rey, and punitive expeditions. Thus the mountains were emptied of people and the fertile lowlands began to be developed.

The Yungas uplands are today peopled by Kolla shepherds and agriculturalists. Lower, in the piedmont zone, Guaranís are added. They descend from the Chiriguanos which by government harassment and slaughter were expelled from southern Bolivia at the end of the 19th century and who gravitated to the sugar-mills because of their need to work. In the region around Calilegua National Park live 32 recognized communities. They keep their ancestral traditions alive in a territory which, paradoxically, the "lords of the forest" have never been able to conquer.

Signs of life

In the Yungas forest parks of the NW the exuberant vegetation and the shy behaviour of many mammals make them hard to see. Their tracks, however, are to be found everywhere. With this little help and some detective work you may be able to identify some of the mammals active in the park.

Jaguar *(Leo onca)*

Beside dirt roads, especially after a night's rain. Rounded and the size of a human fist (13 cm). Digits are spread. The whole print is usually deep. Occasionally the hind paw´s print is superimposed on the forepaw's.

Ocelot *(Leopardos pardalis)*

On paths and trails, sometimes by a forest stream. Tracks are twice the size of those of a domestic cat (5 to 6 cm). Digits are more deeply marked than pad which is usually circular. Tracks are occasionally superimposed.

Tapir *(Tapirus terrestris)*

Mostly beside streams and rivers. The largest mammal tracks in the Yungas (18 cm). Three triangular hooves (nails) are well-marked, usually pointing forward. The pad is faintly marked. In soft soil the forefoot's fourth digit's print is seen.

Long-tailed Otter
(Lontra longicaudis)

On the sandy shores of rivers and streams, sometimes under overhanging boughs and roots (on which scats are left). The pad, five oval digits and nails leave imprints, with a hint of the interdigital web. The whole is some 5 cm across. Tracks are kleft in all directions, sometimes in a circle. The mark left by the dragging tail is sometimes evident.

Crab-eating Raccoon
(Procion cancrivorus)

In the mud beside streams, irrigation ditches and trails or roads, as also deep in the forest. Then tracks are of the whole paw - plantigrade. Imprints of five long digits and the claws are left. The forepaw has long fingers spread like a human hand, some 5 cm long., hindpaw 9 cm long.

Brown Brocket
(Mazama gouazoubira)

On trails and crossing roads, even near ranger stations or campgrounds. Two small slots, short (3 cm) and usually equilateral. The tips are more deeply marked than the hind part.

White-lipped Peccari *(Tayassu pecari)*

Paths, trails, deep forest or main roads. The hooves leave tracks like two half-moons face to face. The leading part is more pointed and more separate. 5 to 6 cm, they are larger than those of the Collared Peccari. The gap between each hoof-print is wider and stands higher. Often many together as peccaris move around in herds.

Crab-eating Fox
(Cerdocyon thous)

On trails, roads, by streams and rivers, near houses and campgrounds. Some 4 cm long and oval, the digits are close together and claws are marked. In softer ground, occasionally the "heel" is slightly marked where the animal has sat. Scats have one fine and curly end. Hindpaw tracks seldom overlay forepaw tracks.

**In all cases, the illustrations are of the right feet of the animal, both fore and hind.*

Laguna de los Pozuelos

Natural Monument

Only on the plains of Tibet can one be higher than on the desert intermontane plateau that runs south from Lake Titicac in Bolivia, into northwest Argentina. Though today it rises to 4000m above sea-level, in the remote past it was under the sea as the abundance of marine fossils proves. Some 400 million years ago a mighty crash between tectonic plates of the Earth's crust laid bare these fossils and exposed them to the light. The final thrust was by those same plates as they uplifted the mighty Andes range of mountains.

The Incas called the northern extreme of this plateau the Puna (desert or cold land), which was about right. Western Jujuy, Salta and Catamarca provinces are hardly hospitable. In spite of the Tropic of Capricorn's presence, the elevation imposes on the region a climate similar to Patagonia's and the air is 40% reduced in oxygen when compared to that at sea-level. Surrounding walls of mountains impede the arrival of damp oceanic air masses so rainfall is scarce. The soil, made up of particles from the base rock, contains vir-

Chilean Flamingos on Laguna de los Pozuelos. *Top left corner:* Kolla girl. *Top:* Vicuña.

tually no organic matter. As a result, both plants and animals have had to develop drastic adaptations, and it is because of this that the region boasts such a high proportion of endemic species.

The Puna is walled in to the east by the Cordillera Oriental and its snowy peaks, and on the west by a string of volcanos dominated by the Ojos del Salado, at 6887 m above sea-level the highest active volcano on Earth - according to the Guinness Book of Records. Between these monstrous peaks run quite respectable ranges interspersed with broad valleys, into depressions in the last of which flow temporary streams from snow-melt or the very occasional summer cloud-bursts. On the way these freshets wash down rock and volcanic soil liberally endowed with salts. Thus are formed the shallow lakes of high salt content that dry up because of the great evaporation to form salt flats.

Pozuelos is the largest of all the area's salt lakes. In NW Jujuy province and hemmed in by the

Laguna de los Pozuelos

Natural Monument

Cochinoca and San Jose sierras Pozuelos's 16000 hectares attracts one of the greatest concentrations of waterbirds in the country. The most numerous group are the flamingos; (some 30,000 were once censused) including the three species. Also numerous are the silvery grebes, the Andean goose, crested duck and, regional specials, the giant and horned coots, Andean avocets and the Puna plover. In summer are added numbers of visitors from the northern hemisphere - Wilson's phalaropes and the Hudsonian godwit. To these waterbirds the land adds mammals such as the vicuña, puma, foxes, armadillos as well as birds such as the Puna rhea and the Andean lapwing. In the diaphanous sky such masters of aerobatics as the Andean condor and the Puna hawk show off their prowess.

It is no accident then that Pozuelos is one of the favourite destinations of ecotourism fans. Nor that it is protected under several systems - in 1981 it became a Natural Monument, while nine years later it was declared the intangible core of the Man and the Biosphere Reserve of the same name. This last covers some 380,000 hectares of the watershed (see page 51). In 1992 it was declared our first RAMSAR site, as an internationally important wetland. Its best line of defense, however, is in the resident families of Kollas in its environs. Pachamama, the Earth Godess, has always provided them with food, a roof, medicinal herbs, fodder for their sheep and llamas. They know how to repay such generosity.

Useful Data

Laguna de los Pozuelos Natural Monument

Pozuelos Natural Monument was created on the 28th January 1981 in the Puna biome and covers an area of 16,224 hectares. The name seems to derive from the pot-holes around Cienaga Grande (SW of the lake) which are filled by the occasional shower. Another theory is based on the circular hollows that flamingos leave when feeding in one place while spinning around.and stirring up the bottom mud together with the micro-organisms on which the birds feed. These are evident in winter when the lake's level drops.

To get to Pozuelos from San Salvador de Jujuy, the provincial capital city, take Rt 9 to Abra Pampa where the administrative offices are. Then west along Rt 7 as far as the ranger's house and in towards the lake along a by-road – a total of 272Km. The provincial capital has bus connections to and from all parts of the country and daily flights from Buenos Aires and Cordoba. To reach the lake one can take a rented car from Jujuy, use the services offered by travel agents or go by public bus as far as Abra Pampa, then cover the remaining 50Km to the lake in a rented car (with driver – "remis") or on the daily bus (except Sundays) which runs as far as Rinconada and goes past the entrance track. From the north (La Quiaca) take Rts 5, 69 and 7 (a total of 81Km).

There is no entrance fee charged.

To sleep, eat or obtain fuel: there are absolutely no services available in the area. At Abra Pampa, some 50Km east, there are four guest houses, a few places to eat and a service station, while in Rinconada there is only a place to eat.

The climate is highland arid with tremendous daily variation in temperature (up to 43ºC). The average in winter is 8º (can drop to 30º below feezing) and in summer 16º (maximum 30). Annual rainfall averages some 200 mm, nearly all in summer. There are severe frosts and occasional snow flurries in the colder months. The best time to visit is in March and April, after the rainy season, when the lake is tinged pink by the flocks of flamingos. The scarce summer rainfall is often in heavy showers which can cut the roads.

Nearby attractions: at Lagunillas (west of the park) small lakes concentrate waterbirds; this is 35Km from the ranger's house. From Abra Pampa one can visit the historic villages of Cochinoca (23Km along Rt 71) or Casabindo (60Km along Rt 11) the only place where bull fighting is allowed in the country. Also the dreamlike Salinas Grandes (125Km along Rts 40 and 16).

For more information contact
Monumento Natural Laguna de los Pozuelos,
Rivadavia 339, 4640 ABRA PAMPA,
Provincia de Jujuy.
Tel (03887) 491338, fax (03887) 491054.

Recreational Activities

Bird-watching:

Luis Mario Lossia in his *Favor de Alas* places bird-watching amongst "the least abstract ways of achieving happiness". Pozuelos offers the enthusiast a uncommon chance. At the lake and in its surroundings some 90 species can be ticked off the list, many of which can only be seen here, in the Puna and High Andes. Further, the spectacle is indeed a sight for sore binoculars. The amorous behaviour of ducks, coots, geese and flamingos is a spectacle in itself. What else can an *aficionado* want?

Andean Gull

Species of Values

Life in the Pink

Pozuelos attracts three of the six species of flamingos in the world - the austral, andean and James's, but only the first nests there. The other two only come to the lake to feed. Austral flamingos feed on just about anything - mud, and the algae and crustaceans in it, while the other two are plankton feeders. However, their mechaniscs of feeding are the same - pumping water to filter it through the lamellae of the bill. It is the separation of the platelets forming this filter that determines the size of food taken by each species and thus avoids overlap and competition for the same resource.

In defense of water

Ecologists group under "wetlands" a range of different types of bodies of water - tidal mud-flats, lakes, marshes and swamps, flood plains and peat bogs. Between them they cover 6% of the Earth's land, a total of 570 million hectares and they are essential as much for man as they are for wildlife.

The RAMSAR Convention was initiated in the early 1970's with the object of promoting and coordinating global action in defense of these strategic and threatened habitats. Countries which adhere to the treaty commit themselves to adding each year at least one site to the list of Wetlands of International Importance and ensure the continuation of its ecological processes through conservation, rational use and management.

Argentina joined the Convention in 1991 and its first initiative in this direction were three sites within the system of nationally protected areas: Pozuelos and the national parks of Rio Pilcomayo and Laguna Blanca. Today there are 14 such RAMSAR sites totalling some 3,579,863 hectares - an area 600,000 hectares larger than the province of Misiones.

Flames of hope

Under the auspices of UNESCO, Biosphere Reserves aim at promoting the conservation of biodiversity while fomenting socio-economic development. The formula is necessary in Pozuelos, the dampest sector of the Puna, where overstocking with sheep has had a severe impact on the habitat, and has seriously affected the vegetation which in turn allows for accelerated erosion. As a result the future of some 3,500 Kolla subsistence shepherds (the greatest concentration of people in the Puna) is uncertain.

Though it may seem ironical, breeders, technicians and government together are attacking the problem through genetic improvement of the sheep. "The numbers of sheep will fall as shepherds receive better money for quality fleeces off fewer animals" say the experts. At the same time the breeding of llamas is being promoted. The llama is much gentler on the environment and its fibre is fetching good prices and better demand on the world market. The cycle closes neatly when this fibre is processed locally as a handicraft, thus keeping the added value in the region.

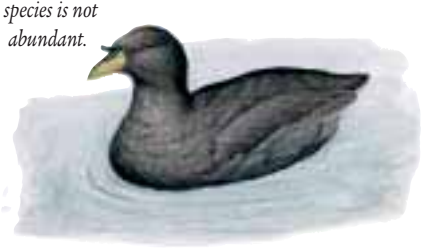
Strengthening the Kolla organizations such as Red Puna (Puna Network), with some 1200 families from 70 communities, or the Warmis knitting and weaving cooperative, will result in an auspicious framework for these initiatives. At the same time the recuperation in numbers of the vicuña which produces the finest and most sought after fibre, has mde available again, for producers and artesans, an incalculably valuable resource. In Cieneguillas, just a few miles north of Pozuelos, the wild population of these animals has been sustainably shorn since 2003.

Andean Goose
(Chloephaga melanoptera)

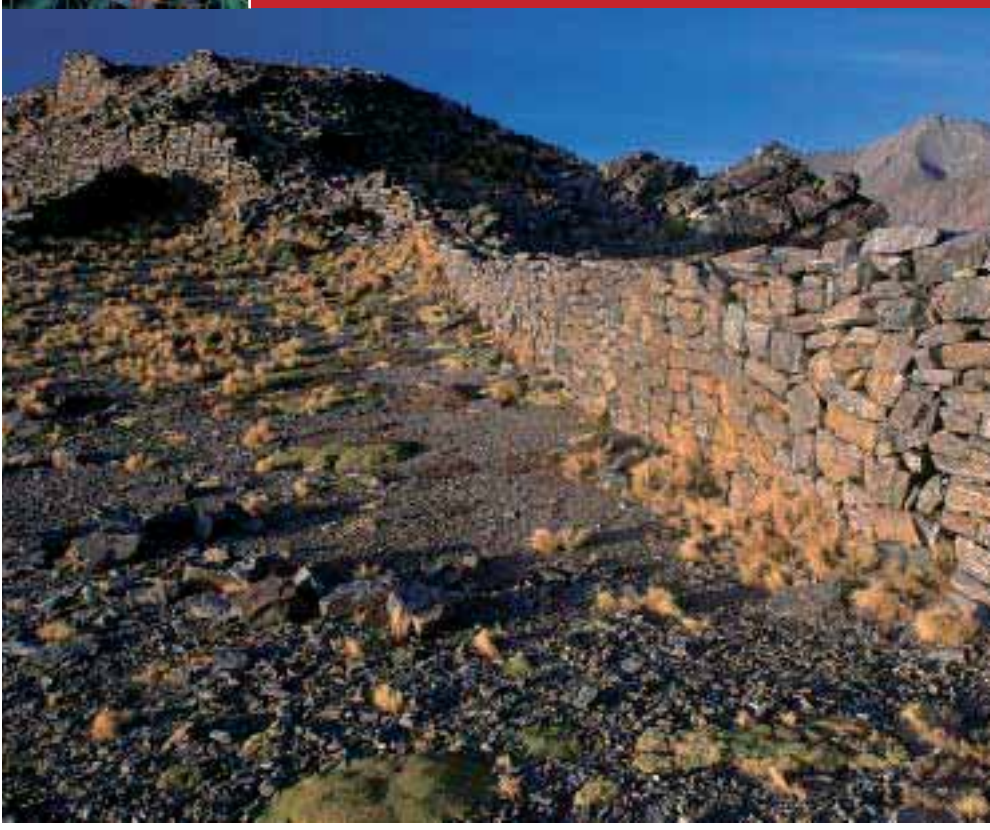
Exclusive to the Puna and High Andes, this is the largest of the geese found in the country. It feeds on the tender grass shoots which grow in damp places near water. Pairs tend to lasst a life-time and the nest is on the ground. In defense of its territory it has recourse to the knobs on the leading edge of the wing which it uses to great effect. However, it is shy of man, unlike the others of its genus.

Horned Coot
(Fulica cornuta)

Almost as big as the giant coot with which it shares the habitat, the largest coots in the world (60cm long and weighing in at 2.3Kg). From its frontal shield a "horn" dangles, but varies in shape and attitude according to the situation of the bird - inflated and upstanding when confronting an intruder. Sometimes this is not enough to see the other off and a battle ensues - mostly just chases over the surface of the water which disrupts the peace of the place. On Pozuelos lake it finds enough waterweed to feed on and to build its floating nest at a prudent distance from the shore. In spite of this the species is not abundant.



Campo de los Alisos
National Park



The ruins of the Quilmes are often called the "*Argentine Machu Picchu*" but the similarity is better applied to this, the most southern and steepest of the national parks in the Yungas with its 10,661 hectares on the east-facing slope of the Aconquija range of mountains.

From the base to the distant sky-line runs a winding trail on which one can follow the footsteps and gain an understanding of Pablo Neruda in his "Alturas del Machu Picchu" (The heights of Machu Picchu). This trail starts at La Jaya, the main entry-point to the protected area, where the river of the same name reminds one of Neruda's "Wilcamayu de sonoros hilos" (The vibrant threads of the Wilcamayu) and the "Urubamba's torrent of Silver". Soon one is climbing his same "Earth's stairway" through the "dreadful thicket of lost forests" up to 4400 metres above sea-level. There stands the "summit reef of human dawn" which is the Ciudacita, one of the most important Inca remains south of Lake Titicaca (see page 55). Yet higher, near the permanent snow, there are scattered mountain sanctuaries, a well-preserved stretch of the Inca trail heads for Chile and the "sombre shadow of the passing condor floats by like a black ship". The ecological importance of Campo de los Alisos holds its own with the archaeological remains. The upland peat bogs and the

Puerta del Sol (Gateway of the Sun), La Ciudacita (Little City). *Top left corner:* Cactus in flower. *Top:* Yungas Tree-tomato

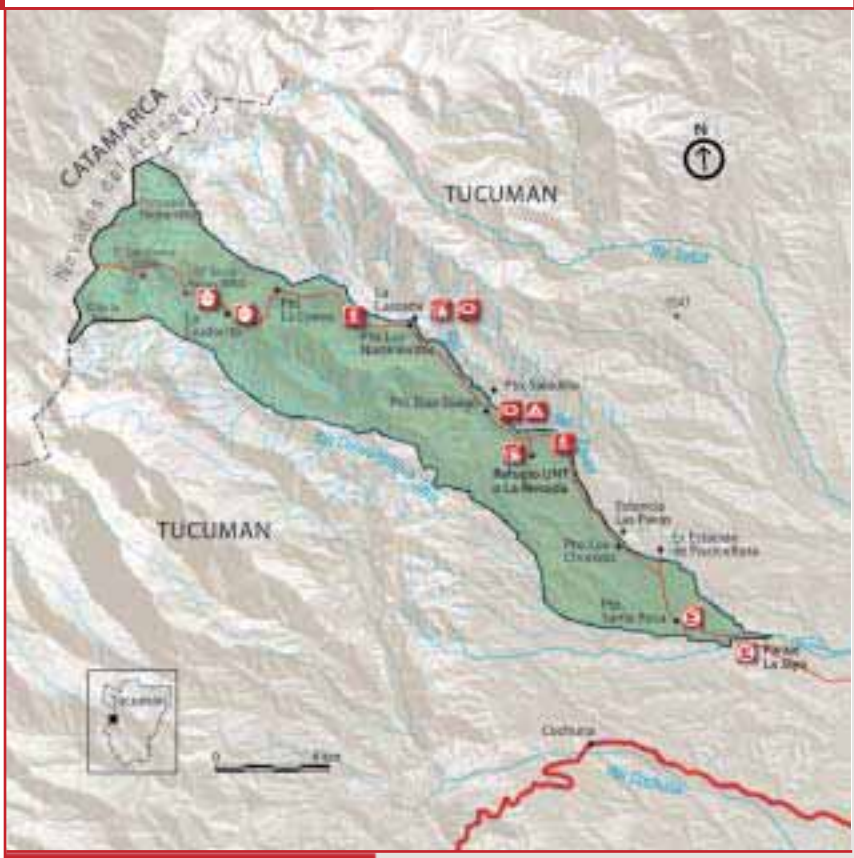
montane forest protect the sources of the Jaya and Las Pavas rivers, just two of the innumerable water-courses that descend from the Aconquija to irrigate the "garden of the republic" as the province of Tucuman is known. On these rivers depends the irrigation of thousands of hectares, the availability of drinking water in the towns and the level of the Rio Hondo dam's lake.

The park, furthermore, is home to a great biodiversity, though the inventory is yet lacks much for completion. However, some surveys give us an indication of the treasures contained within the park. So far some 150 species of plant have been recorded as also 125 vertebrate of the animal kingdom: the outstanding species are the guanaco - one of our humpless camels - and the rare Andean cat and montane frog (both regional endemics), as well as a gamut of endangered and threatened species such as these last two and the ocelot, king of the list, the northern Andean deer and the long-tailed otter. The vegetation also is of great interest botanically as there are certain regional exclusives, trees of lumbering value and some special forage, medicinal or ornamental species. Also found are some relatives of the original potatos, yams, walnuts, a plum, strawberries and the pawpaw; all these are available for improving the genetics of our cultivated strains.

The Yungas tree tomato, a local species, deserves a paragraph to itself. It was cultivated by the Incas and its spread throughout the world is attributed to British colonialism. Today it is commercially cultivated in Peru, Ecuador, Colombia, South Africa and especially in New Zealand where a premium quality has been achieved after half a century of careful genetic selection. Under the name of "tamarillo" it is winning a place in the international market. In its native Bolivia and Argentina it has never been considered anything but a curious ornamental. The fleshy fruit which shines brightly out with the lush green foliage of the alders is a reminder that undervaluing one's own resources is a serious mistake.

Campo de los Alisos

National Park



Recreational Activities

Trekking

The hike to the Inca ruins from La Jaya at the entrance to the park (between 847 and 4400 metres above sea-level) demands a good set of legs, certain experience at mountain walking, and takes something like a week up and down. It is also possible to rent a horse or mule for the ascent which makes it easier but no shorter in time. Mounts and a guide can be obtained in nearby Alpachiri.

"Between the tumbling waters and the wall" as Neruda says, there are three places where tenting is permitted: the La Mesada refuge (11Km up), the Puesto Don Diego at the Mesada campsite (2 Km further up), and above the forest and the clouds, at Puesto La Cascada (5Km yet further) which offers a wonderful panorama. From there it is only a 7Km walk to La Ciudacita. It is wise to start this final assault early in the morning as it is forbidden to camp at the archaeological site

and one must have time to return to base camp at La Cascada.

Before undertaking this trek it is imperative to call at Park HQ in Concepcion for permission and to be informed of the rules and regulations pertinent to the protected area. This is at 24 de Septiembre street, Nº 2044 and attends from 9am to 5pm. The telephone numbers are (03865) 421734 and (03865) 416368.

Useful Data

Campos de los Alisos National Park

The park was created on 4th August 1995 under National Law Nº 24,526. It protects fair samples of the Yungas forests and the High Andes biomes over an area of 10,661 hectares.

The name was inherited from the century-old farm which was expropriated for the purpose of creating the national park and refers to the alder (aliso) woods which grow at middle elevations on the slopes.

Places of interest include La Jaya at 847 metres above sea-level, which is the entrance to the park and start of the ascending trail, La Mesada mountain refuge at 1500 m elevation and the Mesada campsite at 1680 where one can put up a tent. La Cascada (2700m) offers a panoramic view, while at La Ciudacita (4400m) are the archaeological remains.

One reaches the park from Tucuman southward along Rt 38 as far as Concepción where the Park HQ and information desk are located. Then west along Rt 365 to Alpachiri and on for 12 Km along a poorly maintained earth road to La Jaya (total 105 Km), the entrance to the park. Tucuman city is served by bus lines from all over the country and daily flights from Buenos Aires and Cordoba. In Tucuman there are cars to rent or drivers to contract (remises). The bus south leaves one at Alpachiri, 12 Km from the entrance to the park. Or one can put oneself in the hands of a tour operator. It is also possible to hire a pick-up in Concepcion, but all vehicles must be left at the entrance of the park as there are only hiking trails within the park itself.

No entry fee is charged.

Within the park there is a mountain refuge and several places for rough camping, but a permit is required.

For lodging, food or fuel, Alpachiri has gasoline and basic foodstuffs, while Concepcion, some 30Km away, has a few places to lodge, restaurants, grocers', a market and service stations.

The climate varies greatly because of the altitudinal gradient. At the base the average summer temperature is in the region of 28ºC while at La Ciudadcita (4400m) it is 0ºC. In winter 16º and –10º respectively. Annual rainfall amounts to some 2500mm, nearly all in summer, while on the heights it snows profusely. The best time to visit is therefore between autumn and mid-spring as the rains tend to cut the access road and the trail.

Nearby attractions include the captivating Laguna del Tesoro, a lake at 1750 m elevation, reched from Cochuna, some 11Km west of Alpachiri, a six hour hike. The city of San Miguel del Tucuman, provincial capital, also deserves a visit as it is where Argentina's independence was declared in 1816. The building itself where this took place still stands.

For further information contact
Parque Nacional Los Alisos,
24 de Septiembre 2044, Casilla de Correo 43,
4146 Concepcion, Provincia de Tucuman.
Tel (03865) 416368, fax (03865) 421734,
e-mail: losalisos@apn.gov.ar

Recalling Kollasuyu

Over half a millenium ago, under the rule of Tupac Yupanqui, the Incas incorporated Kollasuyu, the southern part of their empire which includes NW Argentina and the Cuyo region (Mendoza, San Juan). Though Inca domination lasted but seventy years, evidence of their presence in out territory is abundant. One of the most important remains is found at high elevation in Campo de Los Alisos National Park.

The Ciudacita, or Pueblo Viejo de Aconquija (Aconquija's Old Town) is one of the very few architectually monumental and purely Inca remains south of Lake Titicaca. The ceremonial grounds, homes, walled squares, sacred stones and corrals are spread over two separate settlements between which there is a stone-paved path up to 3m wide. This path goes "over the top" to join the Inca trail which leads to Chile through the San Francisco pass.

What was the Ciudacita? An administrative and political centre as an outpost on the frontier. The population was in all likelihood made up of settlers (mitimaes). It also functioned as a religious centre as in the walled squares the cult to the Sun God was performed. Such settlements as this, connected by the intricate web of Inca trails, allowed the empire to lay claim to Kollasuyu and ensure its control. Today, together with the whole length of the Inca Trail (the main north-south artery) they seek recognition as a World Cultural Heritage Site.

Los Cardones
National Park

For centuries Andean man has been treating his ailments with medicinal plants such as muña-muña (*Satureja parviflora*), using the fleece of the vicuña to weave the finest ponchos, or feeding his fire with yareta (*Azorella sp*) or queñoa (*Polylepis tomentella*). However, no single species has given him as much as has the columnar cactus standing like candelabra, the cardon or pasacana.

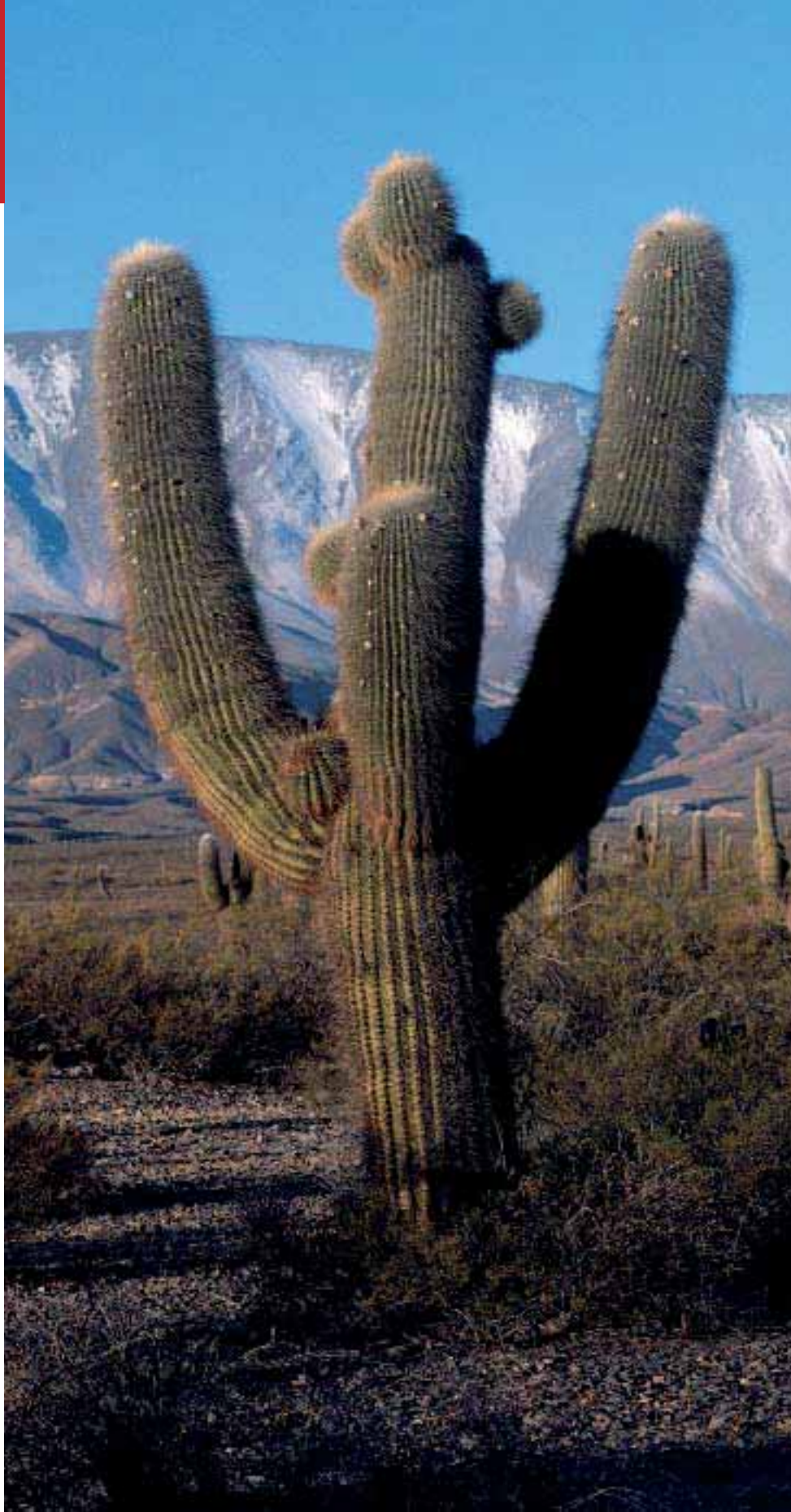
It serves as forrage in severe droughts, as an oasis by storing amazing volumes of water, offers a sweet fruit used as food and as a dye, it foretells rain by opening it flowers with the precision of a barometer, the long yellowish thorns serve knitters and weavers as needles and pins. To cap it all its light wood is strong and is used in making everything from the little drums which announce the arrival of Carnival, the main feast in the region in February, to toys, furniture, corrals, house beams and even the frames of looms. Some churches have chests, confessionals and even altars made of this wood.

On 20th November 1996, just a few centuries too late, we started to recognize the services rendered us by the cardoon. It was the date on which was created the Los Cardones National Park; the 64,117 hectares therein protected contain the largest stand of the species in the country, as well as one of the most dense.

Overlooked by Mount Malcante or Negro at 5226 metres above sea level, the park is one of the attractions of the Calchaqui valleys' tourist circuit. Something between 30 and 50 thousand visitors grind up the Obispo climb to reach the park. This is because of the rightly famous spectacles and landscapes which reward the visitor: Valle Encantado (enchanted) with its strange formations, little lakes and condors, the Cachipampa plain where the Hervidero lake draws herds of guanacos, and with the backdrop of gentle mountains, the cardoon forest of Tin-Tin.

The ecological importance of the protected area is no less than the touristic. Within its borders the park has representative areas of no less than three biomes which, until this park was created, had little representation within the system of national parks: the High Andes, the Puna and the northern Monte. It is in the upper reaches of this last, also known as the Prepuna, that the cardoon

Valle Encantado (Enchanted Valley). *Top left corner:* Local woman. *Right:* Cardoon cactuses at Tin-Tin.



Los Cardones
National Park

reigns. As an extra, there is even a small intrusion of a Yungas habitat - the cloud grasslands of the Valle Encantado where after rains the whole is a mass of colourful flowers.

On looking more closely, in the Tin-Tin area we find the largest stand of cardoons in the country and one of the few pure woods of churqui (*Acacia caven*), related to mesquite. Further, between Mount Negro and the Apacheta Sierra, the park exposes testimony to the whole geological history of the Calchaqui valleys. Where wildlife is concerned, there are several threatened and endangered species in the park, including the northern Andean deer, a red fox, pampas cat, Tucuman mountain finch. Others are regional exclusives (endemisms) such as the Puna tuco-tuco (a gopher-like rodent), the short-tailed hawk or the black-hooded sierra-finch and such. Some park species are important to society as is the case of the condor, the puma and the guanaco. Even dinosaurs left their tracks here to delight paleontologists.

Noteworthy also is the archaeological importance of Los Cardones. The bare, dry ground is strewn with stone implements and pottery shards which indicates its importance in times past as a hunting-ground and for tool manufacture. The perfectly straight Tin-Tin road shadows a stretch of the Inca trail while on rock-faces in the Valle Encantado prehistoric paintings depict strings of llamas, mating camelids and shielded men. Altogether they depict a fascinating lapse in time, pushing back centuries and cultural horizons to when man first started to produce his own food.

Useful Data

Los Cardones National Park

The park was created on 20th November 1996 under National Law Nº 24,737.
The eco-regions represented are the High Andes, Puna, Northern Monte and a small patch of Yungas grassland habitat. It cover 64,117 hectares. The name is derived from the cardoons (*Trichocereus pasacana*), so abundant in the park. Points of interest are the Valle Encantado at the steepest part of the Obispo climb, Piedra del Molino (mill stone) at 3348 metres elevation at the entrance of the park and important historically, Cachipampa, El Hervidero lake, the mesquite-like woods of Tin-Tin, all along provincial route 33.
To get there from Salta city take rt 68, then 33 for 97 km to Piedra del Molino, the eastern portal of the park. Later rt 147 to Payogasts where the park HQ is located. Salta is daily connected by air toBuenos Aires and Cordoba as well as the destination for busses from all over the country. One can reach the park in rented car, by bus (daily service from Salta to Cachi) or contract the services of one of the 80 or so registered tour operators.
No entry fee is charged.

Lodging, feeding and fuel: the park has none of these facilities but in Payogasta there is lodging, places to eat and petrol to be had. Eleven kilometres further on, at Cachi, there are all manner of places to stay, a well-equipped camp-ground, restaurants, a service station and a hospital.
The climate is dry with great variation in daily temperatures. Average winter temperature is 11º C (frosts are frequent at night), summer average 18ºC with 30 as the maximum. 200mm of rainfall annually, nearly all between November and March. Snow is rare at the lower elevations. Any time of year is suitable for a visit.
Nearby attractions include the village of Cachi with its thick-walled adobe houses, raised sidewalks - a step back into colonial times. The church with its cardoon wood altar, and the archaeological museum both deserve a visit. From the pre-Columbian ruins at La Paya and Las Pailas (14 and 12 km away respectively) a wonderful view is obtained of the Nevado de Cachi (6720 metres) and there are comfortable lodges in the surrounding area.

For more information:
Parque Nacional Los Cardones
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4415 – PAYOGASTA
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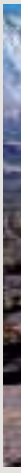
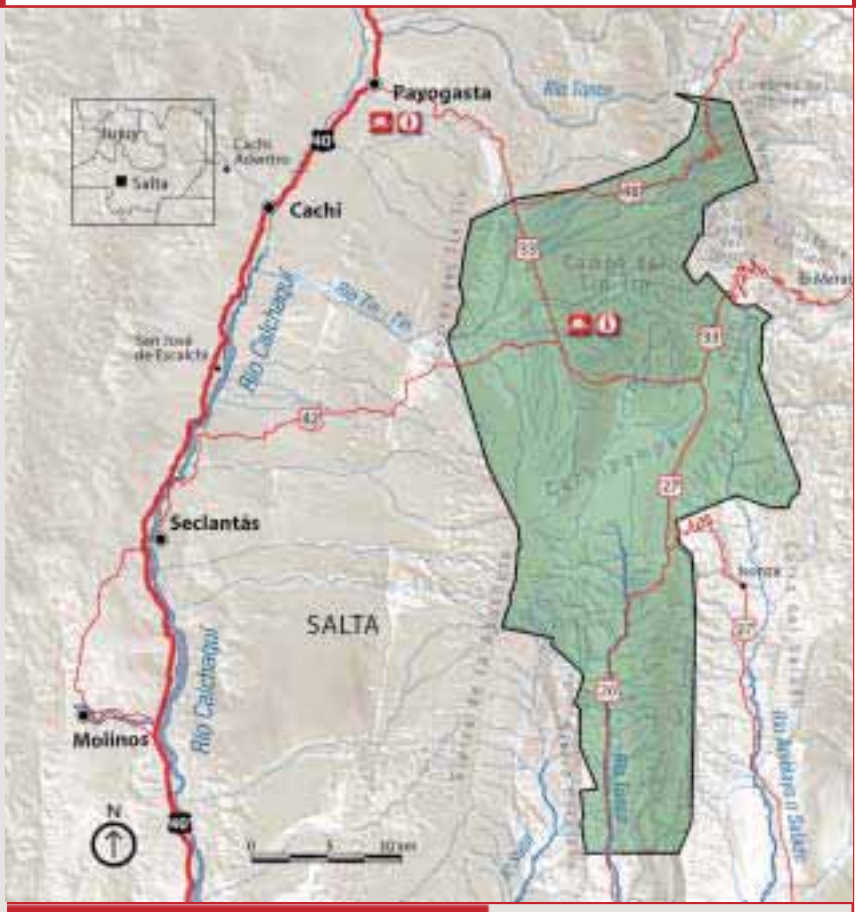
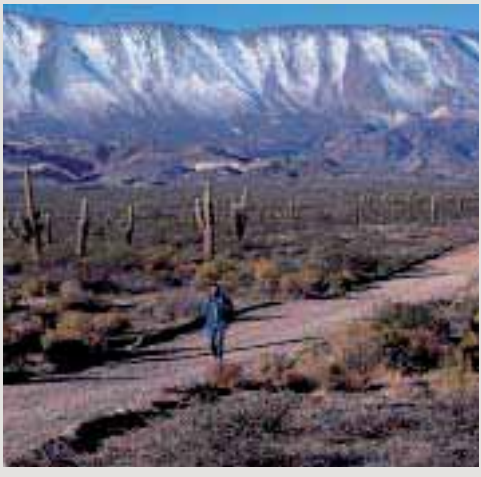




Recreational Activities



Trekking

The 6720m of Cachi mountain (Nevado for its perpetual snows), the highest point in the province of Salta, draw climbers from the Calchaqui area, though the park's 5226m at Cerro Negro or Malcante are not to be shunned. However the main attraction is aimed at hikers. There are few landscapes in Argentina as blessed, charged with enjoyment, free of obstacles. Just walk the cadoon-covered slopes to prove it, or explore the mysterious rocky outcrops in the Valle Encantado, or admire the many-hued mount Tin-Tin while resting in the shade of an acacia. In Cardones enjoyment wears hiking boots.

Troopers' Halt

Valle Encantado has five sites wih rock art which the experts attribute to the period of Late Agropotters (900 to 1480 A.D.). The best preserved paintings cross a rock-shelter's wall with lines of llamas. The sandstone outcrop was undercut by erosion. According to Alvaro Martel, an archaeologist from the University of Tucumán, it is a site for propitious rituals of the troopers who transported goods during pre-Columbian times, something like truckers' wayside shrines dedicated to the various personages of quasi-religious attributes (Difunta Corea, Gauchito Gil and others). It would seem that the picturesque valley was a sort of oasis for these merchants

with their strings of pack-animals. Even today all essentials are present: water, good grazing, shelter and, most important of all, it is at a strategic location on the trail from the dry Calchaqui area to the humid Lerma valley.

Species of Values

Cardoon
(Trichocereus pasacana)

Reaching upto over ten metres and with a girth of over 20 cm, the cardoon is a slow grower - but 10 cm per year. Thus big specimens are over a century old. During its tender young stage it needs shelter from cold and extreme sun under a rock or bush. Some consider it the camel of the plant world - it sucks up an amazing volume of water from rain, expanding its ribbed trunk to store the liquid for times of drought, as does the saguaro cactus, its look-alike in the northern hemisphere. The system of shallow roots even sucks up the dew.

White-Fronted Woodpecker
(Melanerpes cactorum)

Small and lively, this is one of the most attractive birds in the arid Andes. It has no trouble in landing and resting on the thorny sheaths of the cactus and even chisels out its nest-hole in the cardoons. Seldom found singly, it goes about in pairs or small flocks of up to 6 birds. Unlike most other woodpeckers it can capture insects on the wing and feeds on the fruit of the cactus.

Andean Hog-Nosed Skunk *(Conepatus chinga rex)*

The andean species of skunk has broad white stripes along its back, a snowy tail and is large (80cm from nose to tail tip). In all else it is a typical skunk - sleeping in its burrow during the day-light hours, emerging at dusk to search for its food. With its long claws it digs for grubs, larvae, snails, insects, and cunningly obtains other foods such as birds' eggs or nestlings or small reptiles. Having greater adaptability than the stoats and weasels, its relatives, it also feeds on roots and bulbs. It must have little to fear on it nocturnal perambulations as its defence is in the evil-smelling spray it shoots at enemies and other danger, as far as 4 metres away and up to eleven consecutive times. Humans as well as predators steer clear of skunks.

A Wonderful trail

In the mid-XVth century, in an effort to unify their vast empire, the Incas consolidated and developed the network of trails built by the Andean peoples during the previous 2000 years. A century later it was the Spaniards who took advantage of these flag-stoned trails to expand their conquests. Today the *Qhapaq-Ñan* (the main Andean trail) and the archaeological sites along it, compete for recognition as a World Heritage Site thanks to the efforts of Argentina, Chile, Bolivia, Peru, Ecuador and Colombia.

In our country that feat of planning and engineering crosses seven provinces from Jujuy to Mendoza, and four national parks, Cardones being one of them. Through the middle of the park traverses the Tin-Tin straight stretch of road and its "*tambos*" (stopping places) which joins the Lerma valley with Potrero de Payogasta, La Paya and other Inca centres. Along this road and well within the park, a small nucleus of Calchaqui families breed the smaller domestic animals and produce wonderful goat's cheeses, spin fleeces and weave dreams, while praying to Pachamama - the earth goddess. They are an example of Andean man's capacity to inhabit and make a living off one of Argentina's crudest habitats.

Copo
National Park

In 1907, when Ricardo Rojas wrote his "El País de la Selva" (The country of forests), native woods still covered some eighty percent of the province of Santiago del Estero (10,792,200 hectares). By mid-century, overtaken by the desert and poverty, the province inspired Oreste di Lullo's "La Agonía de los Pueblos" (The agony of the people). Between Rojas and di Lullo no wars had taken place, no catastrophes of apocalyptic proportions. Only the trains had arrived, bringing in products which effectively killed the nascent local industry. In exchange they carried away 170 million tons of wood as red quebracho sleepers for the tracks, or for posts to fence in the vast Pampas, or hold up the vines of Cuyo.

The felling of the quebracho was but the beginning - there followed clearing of the rest for charcoal and fire-wood, a process accentuated by the world wars, and uncontrolled range livestock which effectively put paid to any hope of recuperation of the vegetation. Today only 21% of the original woods remain (2,302,829 hectares), and the effects of this devastation are droughts, floods, desertification, extinction of species... It is no accident that Santiago del Estero is one of the poorest (nay, impoverished) provinces in the country, with frighteningly high incidence of malnutrition, illiteracy and emigration of the population.

Away from the tracks and untouched by "civilization", the north of the province was for a time free from the rape of the woodlands and the opportunity

was not wasted: in 1968, with the creation of the Copo Forest Reserve the provincial government saved one of the last remaining large stands of red quebracho. A quarter of a century later the status of the area was promoted to Provincial Park, while in the year 2000 its survival was guaranteed by its declaration as a nation-

Typical Copo National Park landscape. *Top left corner:* Quimil cactus flower. *Left:* Puma. *Top right corner:* Red Quebracho from Santiago del Estero.

al park. To the west some 55 thousand hectares are still the provincial park and act as a buffer zone. After decades of agricultural expansion, this constitutes what is today considered the best remnant of the Dry Chaco.

The 114,250 hectares of the national park are tucked up in the NE corner of the province, backing onto the "impenetrable" where the highest day temperatures in the country have been recorded (over 50°C). They are cloaked in what is virtually virgin woods. The undoubted monarch of these is certainly the Santiago red quebracho (*Schinopsis quebrachocolorado*) whose name comes from the Spanish "quiebra" for break, and "acha" - axe. This tree reaches 25 metres in height and has incredibly hard wood which is resistant to weathering and rot. Indeed, in water it takes on the consistency of stone. This monarch's court is composed of some forty species of tree with the white quebracho (*Aspidosperma quebrachoblanco*) - no relation but

Copo
National Park

also an axe-breaker - mistol (*Ziziphus mistol*), guayacán (*Caesalpinia paraguariensis*), itin (a leafless, all green barked and thorny *Prosopis*), the (drunken) bottle tree (*Chorisia insignis*) with its yellow flowers. Every here and there these woods are interrupted by bare ground dominated by trree cactuses or grasslands marking the paleocourses of the Juramento/Salado river.

This varied jigsaw is home to over 300 species of vertebrates including several greatly important to conserve. The list includes the jaguar which has already vanished from the Wet Chaco, and two living fossils - the giant armadillo and the chacoan peccary. Other threatened species continue the list, such as the giant anteater, crowned eagle and a land tortoise. To complete the list we add two species which are abundant but subject to tremendous pressure by exploitation - the turquoise-fronted parrot and the red tegu, a huge lizard.

From all this one can deduce that Copo National Park has all it needs to protect a representative sample of the fabulous Dry Chaco. In the shade of its quebracho trees still thrums the "country of forests" while hope ripens for one of the most vulnerable and singular eco-regions in South America. The end of the story will depend on what happens outside the borders of the park. It is urgent that progress and economic development go hand in hand with the conservation of natural resources and social justice. You can't rebuild a house from a doorhandle.

Useful Data

Copo National Park

The park was created on 22nd November of 2000 by national law Nº 25,366.

It is in the Dry Chaco biome and covers an area of 114,250 hectares.

The name was inherited from the previous Provincial Park which in turn took it from the name of the third largest of the 27 departments of the province (12,604 square kilometres), where the park is situated.
You reach the park from Santiago del Estero city along Rt 34 as far as Taboada; then take Rt 89 to Quimili. Thence provincial Rt 6 to Pampa de los Guanacos (398 km so far). East and west of this locality, along Rt 16, are the access roads. The parks HQ are in Los Pirpintos. Rt 16 also gives access from Resistencia and Salta. To reach the southern en of the park a good dirt road heads northward for 15 km from the school called "Islas Malvinas". The eastern part of the park is reached along a road which runs along the provincial border for some 25 km to the park ranger's house. Pampa de los Guanacos and Pirpintos have daily bus connections to Buenos Aires, Resistencia, Salta and Santiago del Estero.

No entry fee is charged.

Where to lodge, eat or get gasoline: the park has no facilities as yet though there is a place for tents (ask the ranger). In Pampa de los Guanacos there is lodging, a place to eat, a store, gasoline, telephones and a first-aid station; Los Pirpintos is similarly endowed. The climate is warm sub-tropical with a marked dry season; yearly rainfall is in the region of 700 mm between October and March. Average winter temperature is 15ºC with occasional frosts at night; summer's is 28ºC with absolute maximum temperature reaching 50ºC.

The best time to visit is in autumn, winter or spring as summer is unbearably hot and the rains tend to cut the roads.

Nearby points of interest include the turquoise-fronted parrot´s reserve, 80 km from Pampa de los Guanacos along the provincial border track (Picada Interprovincial), 30,750 hectares of its habitat. This reserve is financed by the Ele Project, for biologically sustainable and socially fair harvest of young parrots for the pet trade.

For more information contact
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Province of Santiago del Estero
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Recreational Activities

Wildlife observation

Copo is well suited for watching wildlife as the sparse trees and abundance of species offer great opportunities. The best times are at dawn or dusk because of the heat. The park's internal trails can be walked or driven, and along the eastern and northern borders of the park. Crossing the trails one can encounter the red tegu, three-banded armadillos, foxes or brown brockets. Tree-top denizens include the crowned eagle, turquoise-fronted parrot or the king vulture. The open grass is home to flocks of greater rheas and a wide variety of bird species. Where termite mounds aboud there is always a chance of a giant anteater. But the giant armadillo, the jaguar and the chacoan peccary are too shy to let themselves be seen so we must be content with finding their tracks.

Brown Brocket

Copo
National Park

Species of Values

The Jaguar *(Leo onca)*

There is no larger cat today in the Americas than the "dreadful beast" of the Guarani indians. In the woods it even takes on the tapir, that "great animal", and the fearful cayman. But the jaguar has not been able to cope with our expanding society - its distribution in Argentina, which once reached Patagonia, is now reduced to the Misiones rainforests of the NE, the Dry Chaco in west central Argentina and the Yungas forests of the NW. Even today the jaguar is losing ground. Small wonder then that it is considered in grave danger of extinction within the country. Nor is it surprising that three provinces and the Nation itself have declared the species a Natural Monument.

The Quimil Cactus *(Opuntia quimilo)*

This tree cactus which reaches 5 m in height is outstanding for its flame-coloured flowers. These open towards the end of winter when they give colour to the sober tones of the western Chaco. So many insects, such as bees, wasps, flies and ants, seek nectar from the cacrus that at times it seems that it is the plant that hums, according to Mariano Medina in his "Árboles nativos del centro de la Argentina" (Native Trees of Central Argentina). The quimil also attracts the cochineal "beetle" from which the dye for native weaves is obtained, and provides the water to throw at Carnival in some of the villages of the NW. Some of the woodland animals rave over the "pricky-pear" fruit of this cactus, especially the Chacoan peccary. Man is indifferent to them but uses the spongy wood to make sewing baskets or cigarette cases, or for filling in the ruts on the track. The sap from the leaves is used to clarify the water in reservoirs, precipitate impurities in lime-wash, guarantee the durability of white-wash, and even for snake-bite.

Turquoise-Fronted Parrot
(Amazona aestiva)

This species nests in holes in trees, especially in the white quebracho. This choice is not by chance - it is one of the few birds that can open the hard and wooden seed-case (and it is always very convenient to have a restaurant near home, especially if one is the only possible client). In captivity the species shows off its amazing ability to imitate human speach. This, together with its colourful plumage has made the parrot a favourite among dealers in wildlife for the pet-trade, to the point of concern for the species' future. Now a rational and sustainable harvest may remove our concern for its survival.

The Chacoan Peccary
(Catagonus wagneri)

This is the largest of the peccaries in the Americas and its Spanish name (pecarí quimilero) refers to its habit of chewing the "leaves" of the Quimil cactus. It is also famous for a tremendous oversight: known from sub-fossils it was considered to have become extinct thousands of years ago. But in 1975 this "fossil" appeared to the biologist Frank Wetzel, alive in the Chaco woods in Paraguay, to mock the deductions of paleontologists. This was not news to the local indigenous people and settlers who always talked of a third species of peccary. But the scientists were not paying attention...

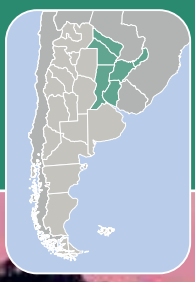
The figures of rapine

Between 1900 and 1970, according to the provincial forest service, the woods of Santiago del Estero provided more than 170 million tons of lumber. Its value today would be several times the national budget.

Between 1900 and 1966, taking only the railways into account, 64,500,000 quebracho posts were shipped to the Pampas for fencing the farms. With this number of posts a fence could reach the moon and come half way back to Earth again.

The price demanded by this bonanza was 150 million quebrachos felled (till 1941), 8,489,371 hectares of woods destroyed, resulting in a drier climate and a people condemned to wander in search of work.

Today this devastation is continuing, aggravated by the lust for soy-bean production. According to official figures, between 1998 and 2004, 51,890 hectares in the Chaco's department of Almirante Brown have been cleared. This is on the east and north borders of Copo National Park, and in spite of the current prohibition, another 83,584 in the Santiago del Estero departments of Copo and Alberdi. Even the provincial reserve has been invaded and affected by clandestine clearing of woods. This precludes the legitimate occupants of the land from producing sustainably from the natural resources. If things continue as they are, in but a few years Copo National Park will be a wooded island without hope of any future. And the province of Santiago del Estero will live again those blackest of years which are but a sad memory today.



Formosa NR
Río Pilcomayo NP
Formosa
Iguazú NP
Chaco
Chaco NP
San Antonio ENR
Colonia Benítez ENR
Misiones
Mburucuyá NP
Corrientes
Santa Fe
Pre Delta NP
El Palmar NP
Entre Ríos

Northeast

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Iguazú
National Park

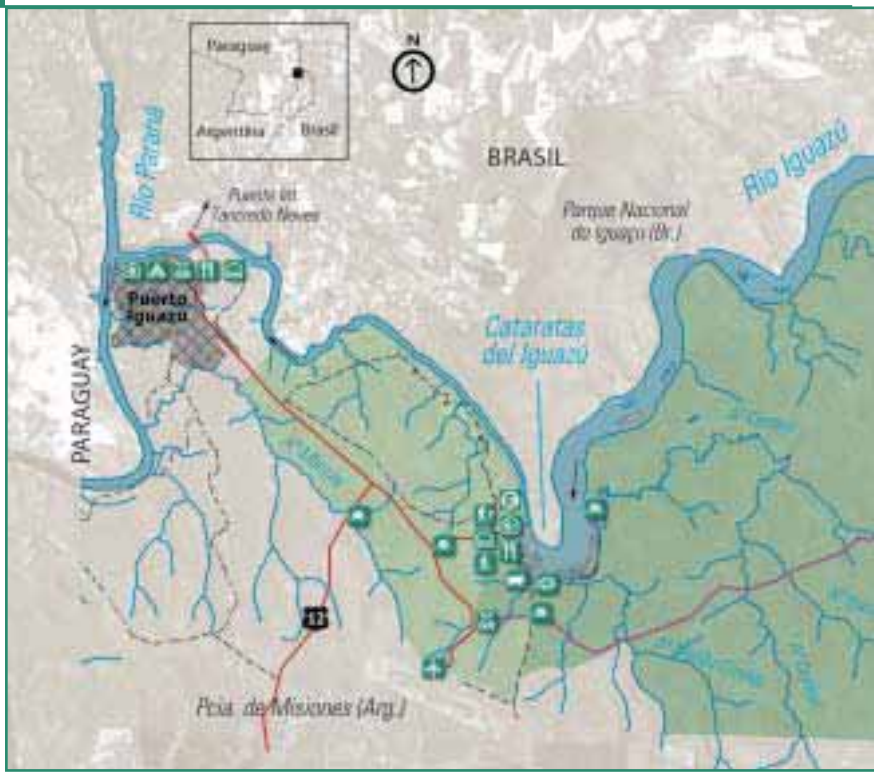
Before joining the Parana river, the Iguazu ("big water" in the Guarani language) attains a width of some 1500 metres and takes a wide swing, with its waters caressing a myriad of islands. This delta (or archipelago) splits the river into many channels that hurry on to the edge of a huge basalt shelf, the remains of volcanic action some 120 million years ago. Each arm of the river forms it own waterfall as it plunges over, some as turbulent cascades, others as gentle veils. These vary in number according to the volume of the river, usually between 160 and 260 separate falls in times of more normal flow. These are the world-renown Iguazu falls, one of the natural wonders of the world, shared by Brazil and Argentina. The Garganta del Diablo (Devil's throat) marks the line dividing the countries and is the largest

Iguazu waterfalls. *Top left corner:* Orchid. *Top left:* Blacksmith frog. *Top right:* Red-breasted Toucan.

and most spectacular of the falls. The 70 metres drop and its 2,700 metres width (mostly in Argentina) make it larger than Niagara (USA/Canada) and Victoria (Zimbabwe/Zambia). Robert Chodat, the Swiss botanist wrote "The waters of the flood falling into the very heart of the Earth" as he sat beneath this "world of falling water". Alvar Nuñez Cabeza de Vaca, Spain's second "Adelantado" (literally "advanced" but meaning an early form of governor) to the River Plate, and the first white man to see the falls, was less inspired when he recorded in his Naufragios "the river leaps off some very high rocks and the water crashes with such force below that the sound can be heard from far away; and the froth of the water, because it falls with such force, rises upwards two lances high and more" Iguazu National Park, created in 1934, protects the falls and 67,620 hectares of Paranaense rainforest, our richest biome. In 1964 it was included in UNESCO's World Natural Heritage category as was the Brazilian counterpart two years later. This list includes such wonders as the Grand Canyon, the Great Barrier Reef off Australia, the Galapagos Islands and other marvels of this planet. Each year over 900,000 visitors arrive from all over the world to see the spectacle, thus generating a not insubstantial economic boom. Gregorio Lezama, the first private owner, undervalued its potential in describing the property laconically in the bill announcing its sale by auction as "a block of forest giving onto various waterfalls".

Domingo Arrayagaray, who acquired it for slightly over one million pesos, built the first hotel, opened trails for people to reach the falls and harvested the valuable timber. By the time that Hipolito Yrigoyen's government bought the lands to turn them into a national park and military colony, not many

Iguazú
National Park



Little Spotted Cat

"cedars" *(Cedrella sp.)*, peteribis *(Cordia trichotoma)* and inciensos *(Myrocarpus frondosus)* still stood but with time and protection Iguazu has recovered completely. Today it is considered the area with most life in the country. It is calculated that there are some two thousand species of higher plant, unequalled in any other region of the country. In this incredible vegetation live some 450 species of birds, (nearly 46% of those found in the whole country), 71 mammals (20% of the Argentine list) and innumerable lesser life-forms. The record includes species that are exclusive to the Paranaense rainforests such as the dwarf brocket, bush dog, "grey" squirrel; threatened species such as the black-fronted piping-guan and the jaguar, and undoubtedly many that are poorly known and that in time may be discovered to be vital for man. We must remember that these forests not only fed but clothed, housed and cured the original inhabitants. They have benefitted modern man by providing "Yerba Mate", the essential infusion drunk by all in four countries, the palmito (edible palm), noble tim-

bers, and many medicinal substances. The Centre for Subtropical Ecology Research (CIES) that operates in the park, has at hand the most promising genetic archives in the country. Further, Iguazu is a place for enjoyment as those who wander the forest trail can confirm - and offers the opportunity of getting to know the environment of the Guarani myths, the Jesuits' contribution and the characters from Horacio Quiroga's stories. The Paranaense Rainforests (or Atlantic Forests) holds the richest biodiversity in Argentina and Paraguay, and in Brazil is second only to Amazon rainforests. Originally it grew over 80,390,800 hectares from the Brazilian states of Espiritu Santo and Minas Gerais to eastern Paraguay and the north of our Corrientes

Useful Data

Iguazú National Park

Iguazu National Park was created on 9th October 1934 under national law Nº 12103. It protects 67,620 hectares of the Paranaense Rainforest and takes its name from the Guarani language words meaning "big – guazu; water -i". The points of interest are the Yvira Reta Visitors' Centre, the Lower Circuit (1400m of trail with stairs), the Upper Walks (1300m out and back – on the level), San Martin island (trails with steep stairs), Macuco Nature trail (7Km out and back), Yacaratia trail (30 Km, only by excursion vehicles). Iguazu National Park is reached from Posadas along Rts 12 and 101 to the entrance portal (267Km). The town of Puerto Iguazu is 18Km west of the park and has bus services from all parts of the country. The airport, 7Km from the falls, has daily flights from Buenos Aires and Cordoba. Taxis, rented chauffeur-driven cars (remis) or a local bus (every half hour from 7am till 7.30pm) join these points to the national park. Tour operators offer excursions. There is a entrance fee (reduced for those under 6 and 12 years of age, Misiones residents, Argentines and citizens of the MERCOSUR countries). Between 1st April and 31st August the park is open from 8am till 6pm; 8am till 7pm the rest of the year. For lodging, food and petrol: there is a 5-star hotel in the park (Sheraton International Iguazu), three restaurants, several fast-food outlets, and kiosks. The town of Puerto Iguazu has all categories for overnighting from smart hotels to campgrounds, restaurants and other places to eat, and supermarkets. Gasoline is available in this town and along Rt 12, but not on Rt 101 that crosses the park. The climate is sub-tropical with no dry season. Average temperatures are 25.7ºC in summer, 14.6ºC in winter. Rainfall amounts to between 1600 and 2000mm each year, spread throughout the year. Ambient humidity is high – between 75% and 90% most of the time. The best time to visit is spring; in summer it can be unpleasantly hot and in the winter holidays the park is crowded. Nearby attractions include the Casa de los Picaflores (Hummingbird House) in the town, 2 blocks from the bus terminal, Güira Oga where injured and threatened birds are rehabilitated, on Rt 12 at Km post 5; the Aripuca, a gigantic inverted replica of the Guarani trap on Rt 12, 1 Km from Güira Oga; Wanda semi-precious stones mines, 43Km S of the park on Rt 12; The Jesuit ruins of San Ignacio – a World Cultural Heritage Site 230Km S along Rt 12; on the Brazilian side the Iguacu National Park entrance is 10Km over the international bridge and along Avenida das Cataratas; Parque das Aves, a bird zoo 300m from the Brazilian National Park's entrance.

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province. Today all but 5.8 million hectares have vanished, and these are spread through thousands of small isolated stands. Misiones province is where the largest continuous forest yet survives and the only place where this region's natural heritage can be preserved forever if the conservation effort is not merely restricted to the passage of well-intentioned laws. There are some 50 protected areas in the province (over 450,000 hectares) and an ecological corridor that links up the more important of these - the much commented Green Corridor. Iguazu was the first block in this defensive wall and for half a century had to battle alone against attrition.

Recreational Activities

Recreational activities are concentrated around the area of waterfalls. Three trails, connected by a narrow-guage train service, allow visitors to appraoch the waterfalls. On speedboats and inflatables one can approach the greater falls (Garganta and San Martin) on the water. A boat serves as ferry over to San Martin island that affords a different perspective. The forests also offer recreation: along Rt 101 one can see the gigantic Palo Rosa trees *(Aspidosperma polyneuron)* and the elegant palmito edible palms *(Euterpe edulis)*. Not far from the falls the Macuco (hiking) and Yacaratia (vehicular) trails provide a close appreciation of the thickets' secrets. The archipelago on the upper river is full of surprises for those who take the gentle drifting rubber raft drift downstream. It is on these outings that one is most likely to encounter the varied but hard-to-see denizens of the rainforest.

A recommended prologue

In the reception area, only 50m from the entrance portal, are the open doors of the Yvira Reta (Guarani for "Land of trees") interpretive centre. However impatient you might be to see the falls, do not pass by, but visit the two wings where, through murals and concise texts, that other facet of Iguazu park is revealed and explained - the rainforest. One wing explains about the forest architecture and animal forms that live there, from insects to the tapir or powerful jaguar; the other section is on man and his relationship with the forest through the history of man's occupation of this habitat. No extra fee is charged for this experience.

By leaps and bounds

From the reception area one can approach the falls on foot along the Sendero Verde (green trail) or by riding a natural gas powered train. But a few metres from the first station is the entrance to the Upper Walks that are 1300m long and suitable for wheelchairs, and the way down to the lower loop circuit (1400m). The first follows the line of the falls before they tumble into the abyss and offers an excelent introduction to the system; it takes about one hour of gentle walking. The lower walks also take about an hour but include steep stairs - but it is certainly worth the effort. They take in splendid views as well as close and intimate approaches to the foot of several falls, even to the point of being able to cool off in the spray of the "big waters". Toucans, caciques, jays and coatis are to be encountered on either walk . The adventure continues on to Garganta del Diablo station, only accessible by train. From there walkways over the water lead from island to island to reach the balconies over the grandest waterfalls of the series at Iguazu. Lacking any stairs this walk-way is suitable for the handicapped and can take up to two hours (2200m altogether - out and back). Remember that the last train returns from

here at 4.30pm. In order to get the most out of your visit you can take a licenced guide contacted at the entrance portal.

A highly favoured balcony

From the embarking jetty on the lower walks a launch ferries people over to San Martin island. To reach the top of this luxuriant rock is equivalent to climbing twelve storeys of stairs. But it is worth it. The overlooks afford interesting and out-of-the-ordinary views of many of the falls and a good panorama of the canyon leading to Garganta del Diablo, impressive in spite of the distance. The free service of crossing is at fifteen minute intervals and functions between 9am and 4pm. It can be affected by the rise in water-levels of the Iguazu river. Bear in mind the time of the last boat so as not to be marrooned for a night.

Powerful emotions

Iguazu Jungle Explorer company offers the Nautical Adventure in which one cruises the lower river in inflatable power-boats. The adventure departs every 20 minutes from 9.30am till 5pm and embarks from the loading area on the lower walks, facing San Martin island. It coasts along the island to Tres Mosqueteros fall from where there is a view of the falls on the Brazilian side and an impressive peek up to distant Garganta. The excursion also reaches the foot of San Martin fall, the largest on its circuit, from where it returns to the jetty. The adventure takes only 12 minutes but is an experience that should not be missed.

Adventure squared

Another of Jungle Explorer's offers is their "Gran Aventura" that lasts about an hour and is a double experience - 8Km along the Yacaratia trail, with intimate views of the forest from an open truck, as far as Puerto Macuco; this is followed by embarking visitors into launches for the 6Km ride up the lower Iguazu, with 2Km of rapids, to approach the falls from below, as far as San Martín waterfall. The expedition ends at the landing pier opposite San Martin island. On this and on the Nautical Adventure it is wise to protect cameras and binoculars against water with plastic bags. Getting a wetting is inevitable.

Drifting down

Jungle Explorer also offers a gentle floating expedition through the islands of the upper river. This adventure is silent and peaceful and is ideal to see the animals and plants of the special gallery forest habitat one traverses. The floating expedition departs from Garganta del Diablo station every 20 minutes, and lasts about half an hour. 9am to 4.30pm in winter, or 5.45pm in summer. A truly "ecological" outing.

Into the forest

The Macuco nature trail, once a logging track, is the way to get on intimate terms with the rainforest. Walking quietly one may encounter a tegu lizard, agouti or brocket, enjoy watching the acrobatic prowess of the capuchin monkeys or the coatis, get views of the colourful forest birds. At the end of the trail is the Arrechea waterfall dropping some 20m. with an irresistable pool at its foot to cool of in. To reach this there is a steep and sometimes slippery descent of the scarp. Out and back entails some 7Km of walking so do not start late in the afternoon so as to return while there is yet daylight. Drinking water and insect repellent are indicated. An alternative for getting to know the rainforest is the safari on Yacaratia trail offered by Explorador Expediciones and their bird-watching excursions (for more information contact explorador.expediciones@rainforestevt.com.ar"

BIG WATER

THE IGUAZU WATERFALLS

1 WALKWAYS

Being wide, they allow for two-way traffic at peak times. The new stretches were built without harming a tree.

Pindo Palm

Red-rumped Caciques

- The sides are removable for times of flooding
- The mesh is of galvanized metal
- There are ramps for the disabled in wheelchairs
- They are **50 cm** above the ground to allow regrowth of the vegetation and for animals to move around unimpeded

2 YVYRA RETA VISITORS' CENTRE

One of the best in the country, spacious, simple and well illustrated, it leads the visitors through a condensed version of the rainforest and invites them to delve into the rich regional history.

General plan

SURFACE AREA 1000 sq m

References → Circulation

Exhibition panels

12

PAY BOOTHS

RECEPTION AREA

For its construction the old Iguazu air-strip was used

E (AUTOMOBILES)

E (OMNIBUS)

Adam and Eve Waterfall

Upper Walks

Bozzetti Waterfall

Upper Walks Station

Green Trail

Interpretive Centre

2

Amphitheatre

Old Cataratas Hotel

General Service Area

Commercial Area

Institutional Area

3

Start of train services

3 TRAIN CIRCULATION

Characteristics

- Run: 4840 m
- Gas locomotive
- Three wagons (120 passengers)
- Speed: 18 to 20 kph
- Runs on a low gravel bed.
- The flanking vegetation deadens the noise
- Destinations: Lower Walks, Upper Walks and Garganta del Diablo.

Heliconius butterfly

Morpho butterfly

Yacaratiá Trail

Macuco Trail

Species of Value

Brown Capuchin Monkey
(Cebus apella)

Brown Capuchin Monkey (Cebus apella)
In the folklore of Misiones the capuchin monkeys - mischievous and brazen - tease the powerful jaguar and cunning fox. And they are certainly capable of this - they are considered the most intelligent of the New World primates. It is no accident that they were the main species used by organ-grinders and are today dependable company for the disabled. They are also used in biomedical research because of their genetic similarity to humans and their apparent abundance. Highly sociable they live in troops of some fifteen individuals under the command of a dominant male. In search of food these clans travel through the forest that is their territory. The species uses all stratae of the forest, including the ground, where they find all manner of foods from insects, fruit, the tender bases of bromeliad leaves. When they have the chance they do not shun birds' nestlings and eggs, frogs, lizards, snails, young coatis and even bats. Demand from zoos and laboratories puts considerable pressure on the populations, but their main problem is the reduction of their forest habitat.

On film

The Iguazu falls have attracted more than one cinema director. None took greater advantage of the natural set than Roland Joffe for his "The Mission" (1986). With Robert De Niro and Jeremy Irons it won the Palme d'Or at the Cannes Film Festival, an Oscar and two Golden Globes.

Three decades before, in her debut as an actress, Isabel Sarli (a local well-endowed star) took a dip in the "big waters" to become the first nude frontal view in Argentine cinema. This was in the film "El trueno entre las hojas" (thunder amongst the leaves), directed by Armando Bo and with a script by the Paraguayan Augusto Roa Bastos. In 1960, for the film "India", the "beautiful savage from the Pampas" as defined by Playboy, repeated her exploit of bathing in the pools beneath the falls, but this time Bo was filming in colour and the dips of that buxom beauty became part of the classics of the big screen.

Strangler Fig
(Ficus luschnathiana)

Each strangler fig tree starts as a tiny seed in the excrement of some bird or monkey and lodged in a hollow of any tree. Soon slender roots extend towards the ground, hugging the host tree. They intertwine and are soldered together. On reaching the ground they thicken vigorously and, closing ranks, eventually engulf the trunk of the host. Thus, murderer and coffin at the same time, the fig replaces the tree it sprouted on with a hollow trunk as the original rots away. Its crown expands a-pace and soon reaches the canopy to become one of the giants of the forest. In this way it has saved itself the effort of growing a rigid trunk.

Lords of the forest

Neighbouring the park there are four of the 41 Mbya-Guarani communities living in the Province of Misiones. These are Fortin Mborore (152 families on 224 hectares), Yryapu (40 families on 264 hectares), Guapoy (11 families on 150 hectares) and Kaaguy Pora (15 families on 230 hectares). The destruction of the forests has imposed on these people a sedentary lifestyle and their need to work as labourers or sell handicrafts to tourists for a living (carved local animals, bows and arrows, necklaces, bracelets and baskets). But much of their resources still come from the forests and their ancestral form of agriculture. Further, they keep up their cultural heritage and identity. Five centuries after the Spanish conquest they still have their language, their traditions, and are still Mbya; one of their achievements is never to have been subjected to the white man.

Do not miss the opportunity of visiting them. No people know more about the forest or how to use it without damaging it, than its former lords. And we have much to thank them for:

- Guarani is the language that has most names in biology, after Latin and Greek. Not only did it survive the Spanish invasion but it has flourished and today five million people speak it in Paraguay, southern Brazil and NE Argentina. It is taught in several European universities and many words have passed into Spanish as Argentinisms - che, tatu, caracu, and the names of many trees and animals.
- It was the Guarani who discovered the properties of the Yerba Mate,the tree that grows in the rainforests of Misiones and from which all Argentines drink an infusion - maté. It is the favourite drink (and ritual) in Paraguay, southern Brazil and Uruguay as well.
- The minutes of our independence were translated into Guarani. Many Guaranis enrolled in our liberating forces with Belgrano and Artigas. San Martin himself was born in Yapeyu - a Guarani village - and some believe that his true mother was Rosa Guaru, a Guarani Indian. Perhaps for this reason he was always nick-named "el indio".

Giant Anteater
(Myrmecophaga tridactyla)

The bizarre shape of this animal did not pass unnoticed. One chronicler of the "Indias" described it as "an animal that, though not very large, is horrendous for its monstruosity and the terrible appearance with which nature endowed it". The Guaranis call it "yurumi", meaning small mouth. Today it is the emblem of conservation in Argentina, a sort of local panda logo. In choosing this species its endangered situation was considered, as also its unmistakable shape and the fact that it belongs to a genus that is exclusively South American. Further, it is seen with a certain empathy for its biological role in the control of ants and termites.

It finds the nests and mounds by scent, a sense forty times more developed than ours, tears open a small hole with its powerful claws and explores the galleries with its long, sticky tongue. After a few seconds this is withdrawn, covered in insects. Prudently it soon searches for another source of ants. How much does it harvest in each sortie? Over 14.000 insects, counted by the remains found in only one dropping.

The species is rare in the Paranaense rainforest, preferring the Chaco's open habitats, but in the park several individuals have been seen. One was the largest specimen ever measured, a female that was killed by a speeding vehicle on Rt 101.

Río Pilcomayo
National Park

On the great plains of the Chaco, as in the myths of the Pilaga,Toba and Mocovi people, the Great Fire and the Big Waters dominate the cycle of life. From the very heart of these catastrophes arises the new landscape, the new world.

The one is sparked during the drought from a parched grassland, awakened by a lightening bolt or by the hand of man, the other spreads its surface mirror when the sky contributes to widening the rivers. Fire and flood, two periodical and alternating factors, are the forces that dominate the natural universe. They nip in the bud any aspirations an pioneer vegetation might have of becoming a woodland, keeping it always in its infantile grass stage. They curtail such advances achieved by the woods during more stable periods; thus they maintain a dynamic equilibrium. Furthermore, it is they that determine what should survive and what succumb. They select, test and put aside the organisms; they demand heroic adaptations for survival such as flame-resistant bark, loss of foliage in the dry season, or even the adaptability of bird reproduction to respond to opportunity rather than season. So the Chaco is like a sorcerer's cauldron continuously on the boil where the only constant is variation.

Of all the Chaco types withing the Gran Chaco, that which is occupied by the Rio Pilcomayo National Park is the Wet or Eastern Chaco, the region with more generous rains and with the greatest biodiversity. Cycles of drought and flood rule life on the vast plain. Only a few centimetres in elevation make the difference between vastly differing habitats. In the low-lying areas the fleshy water vegetation grows. Places flooded for shorter periods are occupied by the grasslands with caranday white palms, the second step in the subtle progression. From this sea of grass and occupying the slight elevations which are never flooded, islands of Chaco woods emerge here and there, constituted by quebracho trees, guayacans, relatives of the mesquite and the pointed and hooked ground bromeliads. On the levées beside the Pilcomayo and its former courses, locally called madrejones, grows the succulent forest of the type growing in Misiones province.

In this fascinating mosaic of habitats there have been 295 species of birds recorded - nearly 30% of the birds of the country, 68

Capybara. *Left:* Caranday palms. *Top:* Laguna Blanca.

Río Pilcomayo
National Park

mammals (19%), 25 amphibians (17%), 31 reptiles (10.5%). Such a prodigious list impelled the inclusion of the park in the list of Internationally Important Wetlands under the RAMSAR Convention. Amongst the wildlife recorded there are several species in danger of extinction, such as the maned wolf, the giant anteater, ocelots, the long-tailed otter and the bare-faced curassow, as well as three stars mentioned on the Guinness Book of Records - the capybara (largest rodent in the world), the tapir (largest South American land mammal), and the howler monkey (considered the noisiest animal on Earth - its howling is clearly heard 5 km away).

Two dirt roads allow the visitor to explore the various habitats of the park and with luck meet some of its residents. One such road leads to the eastern shores of Laguna Blanca, with 700 hectares the largest permanent water in the park, where there is a bathing spot, a look-out tower for spotting wildlife and a well-equipped camping area in an corner frequented by black howler monkeys. The other road ends on the banks of the Pilcomayo river (reddish river in Quechua) after crossing the Poi marsh where large concentrations of waterbirds are wont to be found. And there are islands of woods or grassland studded with palms. Along its 20Km one can see greater rheas, storks, herons, crab-eating foxes, tegu lizards, seven-banded armadillos. The gallery forest on the banks of the river can add toco toucans, kingfishers, long-tailed otters, and occasinally a tapir.

Rio Pilcomayo National Park is one of the most alive places in the country, for the delight of visitors.

Useful Data

Río Pilcomayo National Park

Rio Pilcomayo National Park was created on 17th October 1951 with some 285,000 hectares but was reduced to its present size in 1968. It is in the Wet or Eastern Chaco eco-region and today contains 51,889 hectares. The name comes from the river bounding the north of the park and our international boundary with neighbouring Paraguay - in Quechua *pillco* is red or reddish, while *mayo* or *mayu* is river - hence "reddish river". Places of intrest are the Poi marsh where there are hiking and vehicle interpretive trails, some 7Km north of the village of Laguna Blanca, and the Laguna Blanca recreational area (swimming area, elevated look-out tower, nature trail, jetties) some 5Km north of Naick Neck along a dirt road.

From the provincial capital city of Formosa, go north along Rt 11 to Clorinda, then west along Rt 86 to Naick Neck (173Km) or Laguna Blanca (185Km) where park HQ are located on the highway. Formosa city has daily flights from Buenos Aires and is served by bus lines or connections from all over the country. Rented cars, chauffeur-driven remises or tourist agencies can get you to the park. There is also a daily bus service to Laguna Blanca town from where taxi or remis can be hired to reach the park. No entry fee is charged.

Lodging, feeding and service stations are available in Laguna Blanca and the park has two campgrounds in the recreational areas of Laguna Blanca and Estero Poi, with services such as fire-sites and tables, bathrooms with showers, lighting at night, drinking water, first aid, ranger station, a vehicle for emergencies, less sophisticated at Estero Poi than at Laguna Blanca. The village of Laguna Blanca has an hotel, lodging houses, restaurants, stores and a service station, while Naick Neck only a place to eat and a service station.

The climate is humid and subtropical with a dry season between March and October (annual rainfall is around 1200mm during the hotter months). The yearly average temperatures is 23ºC while summer maximum passes 40º and there is the occasional frost in winter. The best time to visit is between March and November as dirt roads tend to be cut in the rains. Nearby attractions include Guaycolec Wildlife Reserve, a 15,000 hectare expanse with semi-captive animals, 22Km from Formosa city along Rt 11.

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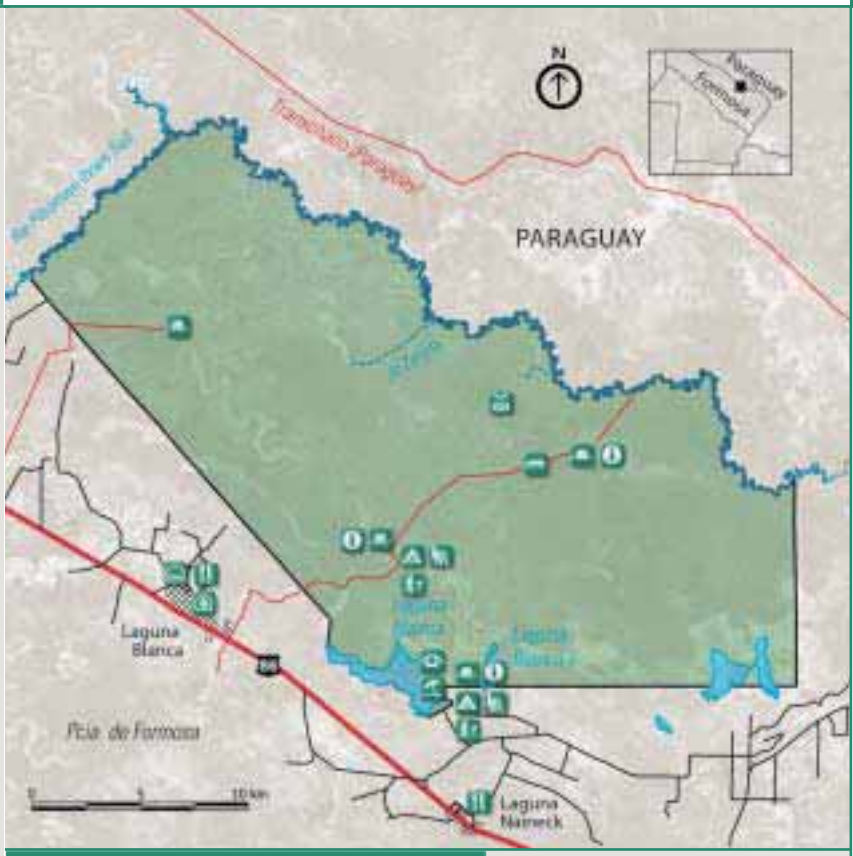

Recreational Activities

Wildlife observation:

The national park offers many opportunities for wildlife viewing. In Estero Poi during the dry season, hundreds of storks and herons concentrate to feed on the fish trapped in drying puddles. The dirt vehicle trail from there to the lower Pilcomayo river crosses the various habitats in the park. With luck one can encounter some of the wildlife. Laguna Blanca is full of surprises: birds such as red-crested cardinals, woodpeckers, various parrots and the occasional troupe of howler monkeys are there. Along the elevated paths at the eastern shore of the lake or from the look-out tower, one can spy the scarlet.headed blackbird, snail-kites, or hear a limpkin hollering from the depth of the reed-beds (especially at dawn). On the shores both species of cayman take sun. Paddling or rowing quietly on the waters of the lake one can even come across a capybara or a pair of crested southern screamers with their chicks.

Red-crested Cardinals

Río Pilcomayo
National Park

Species of Value

White Algarrobo
(Prosopis alba)

Of a very serviceable family of plants - leguminosae - the algarrobos are blessed with the finest of timber that hardly needs seasoning, seeds of great nutritional and proteic value, tanin and dying substances, firewood, forage, medicinal uses, resins and a resource for honey production. Further they protect the soil from erosion and enrich it with abundant nitrogen. It is not a coincidence that the original people of the NW call the tree "Taku" which means simply tree, the only species worthy of that name, and the Guarani name is ***"ibope"*** *(tree placed for eating).*
In USA, Mexico, Israel, Pakistan and some African countries they plant this species of tree to reclaim desertified areas, while here they could become the key species in the development of marginal regions. Everything at present indicates that they will end up as furniture. Excessive demand means that the woods of this species are being felled at an alarming rate in Argentina. Unless this is regulated soon the only place to find the species will be in protected areas such as the Rio Pilcomayo National Park.

Leaf-Cutting Ants
(Atta vollenweideri)

In the Wet Chaco's savannahs the greatest grazers are not mammals as in Africa, but leaf-cutting ants. According to calculations worthy of Ripley's "Believe-it-or-not", just one of the circular nests (that can be 5m in diameter), needs about half a ton of plant material every year. But against all visual evidence, this material is not eaten. It is chewed and turned into mulch on which a fungus is grown and which is the food for the whole colony.

To avoid unwanted intrusions of other fungi into the nursery it appears that the saliva with which the plant material is chewed contains an antibiotic to this end.

The Maned Wolf
(Chrysocyon brachyurus)

In Guarani this name simply means "big fox". It is a timid animal and elicits more compassion than fear in people. It only feeds on small prey - mostly rodents, but also tinamous, lizards, frogs or snakes. At night its howling lament coupled with its stilt-like legs and ghostly appearance have led to the gaucho belief in its being the ware-wolf; it is still scared off by shots from fire-arms, and to this is added the constant reduction in its habitat through agricultural and urban expansion. Lacking any economic motives for its conservation, this largest of South American canids depends now for its survival on natural protected areas. Together with the "white" palm (caranday) it is the emblematic species of Rio Pilcomayo national Park.

The Wood Stork *(Mycteria americana)*

This bald-headed stork is the smallest of the three species of stork found in the Americas (65 cm) and its distribution goes from the Chaco to the southern USA. There are regional migrations and flocks of over a thousand birds are sometimes seen, searching for habitats that offer abundant food resources. It prefers shallow water habitats. Its diet is very varied and includes fish, reptiles (including young caymans of both our species), batrachians, crustaceans, insects and even the occasinal small mammal or bird. Its long legs allow it to wander in damp and watery places in search of prey, while the long neck and bill help it stretch to reach escaping food. Further, the bill is equipped with fine sensory organs to detect nuggets in muddy waters with the efficiency of sonar. Hardly has it felt a morsel than it is clamped in the beak and seldom is this in vain. The immediate response is amongst the fastest reactions timed in nature - 25 miliseconds. This allows it to "hunt" in drying muddy puddles and even at night.

The gospel according to the kom' lek

South of the Rio Pilcomayo National Park are the 5000 hectares of Colonia Primavera of the Toba community. The Tobas are one of the ethnias of the Gran Chaco (in Quechua *chacu* means "hunting ground"). Though their name for themselves is Kom'Lek, they are generally known by their enemies', the Guarani's name which passed to the Spaniards (Toba) and simply means big forehead from their habit of plucking the hair from the fore-crown during periods of mourning. In the Chaco, Formosa and Salta live some 50,000 Kom' Lek. Most still follow the ancient customs of hunting, fishing and gathering, with some agriculture. Even so, few escape the need for manual labour in harvests or as labourers in woodland clearing and saw-mills. Such poor wages are hardly enough to survive on; it is not unusual that they flee from these situations and contribute to the growth of our cities.

In other respects things are going better for them in their common cause and in collaboration with the Wichis and the Avá-Guaranis (Chiriguanos). Their culture is surviving well as is born out by the survival of their language and many traditional customs. Many of the communities have title-deeds to the land they occupy; progress has been made towards a truly bilingual educatuion, and daily the Toba participation in administrative and political jobs is growing. After four centuries of struggle against territorial conquest, the Kom' Lek are facing another challenge: how to integrate modern society without losing their identity.

One of the secrets, though it seems ironical, is the massive conversion to evangelical Christianity which has many points in common with the Tobas beliefs, and through free interpretation of the Bible allows for cultural integration. This has not been in vain. The anthropologist Pablo Wright has said *"the rethinking of worship by the indigenous people has been profound. The formal aspect answers to the western standards, but the religious experience is truly theirs. There are many similarities between the healing services of the piogonak (Shaman) and a service of worship, with rhythmic chanting, prayers and dancing and state of trance".*

Some birds of the Wet Chaco

Jabiru *(Jabiru mycteria)*

Standing erect, nearly 4 feet tall (1.10 m). Bare black head and red collar (lighter in juveniles). Usually found hunting in flooded grasslands and ditches, marshes or swamps. Nests and perches in large trees. Other speciesof storks share its habitat.

Scarlet-headed blackbird
(Amblyramphus holosericeus)

23 cm long and unmistakable with its scarlet head (paler and frecked in juveniles). Seen perched on taller reeds and cattails in stands over water. Sometimes in small flocks. Call is a melodious three or more syllabled high whistle.

Plush-crested Jay
(Cyanocorax chrysops)

32 cm long and attractively coloured denizen of woods and forest. Lives in small flocks, bouncing from branch tobrach or taking short follow-the-leader flights. Sometimes descends to the ground. Unafraid, it often approaches campgrounds or houses; raids orchards for fruit.

Red-crested Cardinal
(Paroaria coronata)

Trusting and abundant. 17 cm long,with a scarlet crest and hood, duller in juveniles. Pairs or small flocks.Perches in vegetation and descends to the ground. The song is lovely, slow, melodious and four-phrased. Open woods, savannah and roadsides.

Brazilian Duck
(Amazonetta brasiliensis)

Fairly trusting. 35 cm long. Male has notable red bill. Usually in pairs. Seen on the water or at rest on the shore. Streams, marshes and ponds.

Anhinga
(Anhinga anhinga)

Like a long, slender, large cormorant some 80 cm long. While swimming only the snake-like neck emerges, black in the male. Perches on waterside trees or emergent snags, wings spread to dry. Soars. Rivers lakes and marshes.

Chaco Chachalaca
(Ortalis canicollis)

Some 52 cm long, this resembles a small chicken or pheasant. Lives in flocks and calls loudly "chachalaCA" in chorus at dawn and dusk. Frequents dry and thorny woods and copses. Often seen at the edge, by roads.

Snail Kite
(Rostrhamus sociabilis)
Some 38 cm long with an unmistakable slender and hooked bill. Young birds and females are streaked. Gregarious, sometimes in large flocks. In slow flight over shallow water. Perches on posts and branches where it deals with the snails on which it feeds.

Chaco
National Park

It never was easy to get Wichi loggers to fell the quebracho trees in the Chaco. The writer Carlos Villafuerte attributes this to a legend that relates that the quebracho as a species made a pact with the devil whereby Lucifer would punish anyone who thought of felling the quebracho trees by raining down on them an invisible shower of slime that caused sores and irremovable stains. "This will save you" he said, and thus it has been since then.

The myth is based on a real fact - that certain sensitive people are allergic to the smell of the flowers of this tree. The natives call it paaj (Quechua for something that flies) while the criollos refer to it as ***flechadura*** (arrow wound). Sometimes merely passing under the tree will bring on the reaction. The first Europeans to suffer the effects were Diego de Rojas' expedition. Father Lozano expresses his unhappiness with certain of the country's trees whose malignant shade caused itching all over the body and disfigurement of the face through swelling. It appears that the quebrachos were as hostile to the invaders as were the Guaycuru and Mataco-Mataguayo indians. Together they all resisted till the

start of the XXth century. But the Remington rifles and axes were stronger than the arrows from people or the trees, and the rape of the land began.

From northern Santa Fe as far as Formosa the dense stands of quebracho were turned into tanin, fence posts, railway sleepers and firewood. Soon cattle and cotton fields occupied the place of the woods and the Chaco's quebracho was on its last legs. To save the species from extinction the National Government set aside the Chaco National Park in 1954, in the heart of the province of the same name.

Panza de Cabra lake. *Top left corner:* Bottle-tree flower. *Top left:* Ringed Kingfisher. *Top right:* Thinning Red Quebracho.

At one time it was to be called the Quebrachal National Park but ecological justice reigned as it is not all quebracho woods. Within its humble 15,000 hectares there are also samples of the gallery forest on the banks of the Rio Negro and the levées that box in the former courses of the meandering river, savannah with groves of caranday white palm, marshes with myriads of water-birds such as storks, herons, ducks, jacanas; this makes up a

Chaco
National Park

complete sample of the various habitats of the Wet Chaco, the richest in biodiversity.

Not all the animals of the biome are found in the park. Missing are the jaguar, ocelot, marsh deer, for example. In spite of this the representation of the faunal cast is somewhat impressive: 56 species of mammal (49% of the species registered for the Wet Chaco), 341 birds (92%), 36 reptiles (45%), 28 amphibiaans (57%), 38 species of fish (25%). Amongst all these are some threatened species such as the giant anteater, the maned wolf, tapir, long-tailed otter, greater rhea, bare-faced curassow, and the short-snouted cayman. There are important populations of capybaras, coatis, brockets, peccaris, herons and storks. Meanwhile the quebracho woods have regained much of their former glory as the abundance of saplings demonstrates, and such enthusiasm has spread to the rest of the region's woodland species of flora.

Just over 100Km separate the capital city of Resistencia from the park. Visitors can count on modern infrastructure to receive them. The natural show which is put on for them is prodigious: howler monkeys chorus at dawn and dusk from the crowns of trees; kingfishers reflect at zero elevation over the water, the sinuosities of the Rio Negro, while a snail kite empties shells on a branch near the water. Marshes and swamps swarm with wings. In the morning light the stands of quebracho take on the majestic appearance of a gothic cathedral. The Chaco National Park pays good tribute to the region which it represents.

Useful Data

Chaco National Park

The Chaco National Park was created on 22nd October 1954 under national law Nº 14,366. It is in the Wet Chaco biome and covers an area of 14,981 hectares. The name comes from the eco-region and the province where it is and is the Quechua word (chacu) for hunting ground. There are several points of interest including the Interpretive Centre at the reception area, the Rio Negro loop hiking trail which starts from the reception area, Carpincho and Yacare lakes some 5Km away along the vehicular road, Ralera de Quebrachos - a pure stand of these trees some 2Km away by the road, Panza de Cabra lagoon 8Km by road. To get to the park from Resistencia take route 16 and just past the toll turn north on 9 to Capitan Solari, from where a local dirt road leads to the park entrance - a total of 112Km. Resistencia has bus services from all over the country and daily flights from Buenos Aires. From here rent a car, take a chauffeur driven remise or a tourist agency tour. There are four bus services per day from Resistencia to Capitan Solari. A minibus takes one on to the park. An entrance fee is charged. For lodging, food or fuel: the service area near the park entrance on the south shore of the Rio Negro has a well equipped campground, with bathrooms, picnic area, fire-sites for cooking; on the banks of the Curiyu lake there is a camping area with fire-sites and tables. Some basic provisions are to be had in Capitan Solari or one can arrange in advance for food to be prepared. Hotels, restaurants, gas stations and supermarkets are to be found in Resistencia. The climate is humid subtropical with a dry season in cooler months (April to October). The average yearly temperature is 22ºC with maximums above 40º in summer and some frosts in winter. Some 900 to 1100mm of rain fall between November and March, so the best time to visit is in the dry from March to November as roads become impassible in times of rain. Of interest in the region is Resistencia itself which has some 175 statues - a sort of open air museum. Cerrito island some 50 Km from town is attractive to nature lovers and fishermen. Over the Belgrano bridge crossing the great Parana river there is the lovely town of Corrientes.

For further information:
Parque Nacional Chaco,
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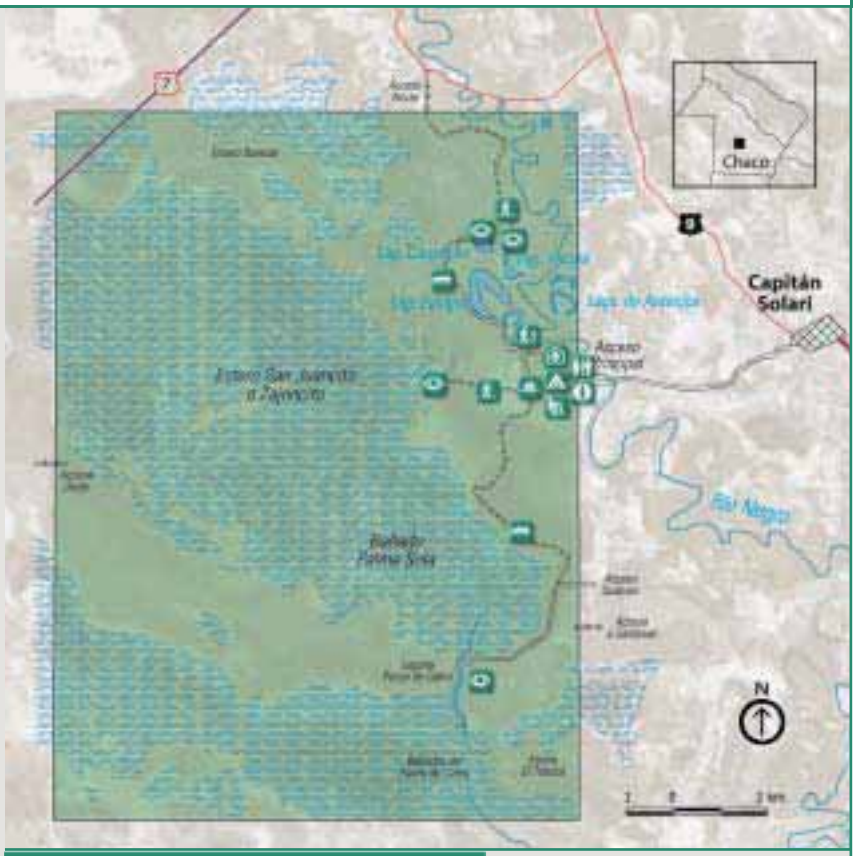


Recreational Activities

Hiking and Wildlife Observation.

There are several and various ways to explore the habitats in the park. From the reception area, across a suspension bridge, the Rio Negro hiking trail, a loop of some 800m in length takes one through the climax Chaco woods and the gallery forest, offering frequent sightings of the howler monkeys, crab-eating foxes, water turtles, and many winged species. Some 5 km from this receprion area, along the road, trails head off to the north (right) towards the two lakes - Carpincho and Yacare - which have lookouts for watching the wildlife. 12Km along another road headed south there is Panza de Cabra lagoon with a camping area, fire-sites and picnic tables. On the road one can admire the pure climax quebracho woods, majestic. Before taking off on these hikes or outings, or on your return, it is as well to visit the Interpretive Centre to pick up the clues for understanding the workings of the particular nature of the Chaco.

Crab-eating Fox

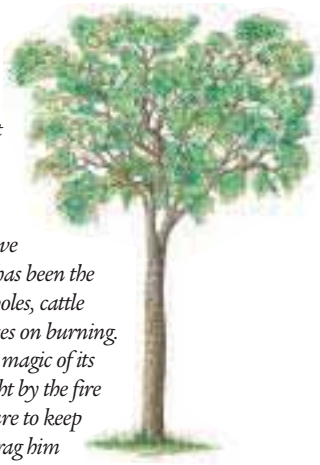
Chaco
National Park

Species of Value

Black Howler Monkey *(Alouatta caraya)*

This is but one of the six species of howler monkeys that live in the Americas. This group of monkeys, the largest with prehensile tails, get their name from the tremendous roaring emitted by the males, usually at dawn and dusk and especially when rain threatens. They have a place in the Guinness Book of Records as the noisiest animals on Earth. Their "howling" can be heard at several kilometres distance. According to biologists these calls are for territorial purposes and to keep distance from other troops. Today and to us they are more like a call fior help. From Mexico to northern Argentina the woods and forests where they live are daily being reduced to lumber and firewood.

The Chaco's Red Quebracho
(Schinopsis balansae)



This is the emblematic tree of the Wet Chaco. With a straight trunk and streaked bark it often grows to over 20m in height and with a diameter of over one metre. The hardness of the wood has given it its fame and name: ***quiebra*** *means to break,* ***hacha*** *is axe - the axe-breaker. No other tree in the world yields such quantities and quality of tanin, and few have wood so unaffected by exposure to elements or damp soil. It has been the favourite for fence posts, railway sleepers, pylons, telegraph poles, cattle grids... It is even surprising in the quantity of calories it releases on burning. The Maskoy indians from Paraguay have an example of the magic of its branches. Whoever kills a jaguar or a person must pass a night by the fire where quebracho* ***(maasit)*** *is being burnt. The crackling is sure to keep him awake and thus ready to scare off any souls seeking to drag him off to madness or death. If only the surviving quebracho woods that remain in the Chaco National Park, were to keep alert and guard against any more devastation of the original Chaco woodland.*

Broad- (Or Short-) Snouted Cayman *(Caiman latirostris)*

This species differs from the Black Cayman, the other species that exists in Argentina, by being slightly smaller (2.5m in males), with a broader and relatively shorter snout, is much less aggressive, and its leather is of greater market value. This last has meant that in the past it was submitted to great hunting pressure. Otherwise they are very similar. Crocodilians have survived since before the dinosaurs and over the last 200 million years have not changed their shape, so it is not surprising that they are considered living fossils. They are the greatest predators in our fresh-water systems of the north of the country, a sort of jaguar of the river, and though it seems a paradox, that same leather that once condemned them to persecution is today their passport to the future - sustainable use of that resource, based on "farming" the wild population wisely, has proved to be the best way of conserving the caymans and the habitat they share with hundreds of other species.

Land laid waste

At the end of the XIXth century the world's demand for tanin, a commodity, forced the attention on the red quebrachos of the Chaco, the highest yielding and best quality tree for this product. Between 1888 and 1895 only logs were exported. Thence the extraction was done locally and in the early XXth century, with *La Forestal*, the industry took on immense proportions. By 1962 when the British company left the country, some 41 and a half million tons (or equivalent number of trees) had been devoured.without any consideration.

Today, in spite of the smaller specimens, quebrachos are still being felled for posts, tanin, firewood and charcoal. Other species which were never considered before are today being used - guayaibi *(Patagonula americana)*, espina corona *(Gleditsia amorphoides)* and guaranina *(Bumelia obtusifolia)*. Present systems of grazing do not allow for the regrowth of target species in areas that have been selectively logged, and are usually exposed to overgrazing. The agricultural frontier advances year by year, replacing the woods with arable land. It is no accident that erosion is increasing and in some places it has become terribly serious - 400 tons lost per hectare; nor that the cyclic flooding, on meeting no resistence from vegetation, should become ever more devastating.

The Tegu Lizard
(Tupinambis teguixin)

Half body and half tail, our largest lizard can grow up to 1.5m in length. In Argentina it lives in that more humid stretch that runs from Formosa to the south of Buenos Aires province. Its close relative, the red tegu or caraguay ***(T. rufescens)*** *keeps to the more arid west. Like all cold-blooded animals they take sun before becoming active. During the colder months they hibernate in burrows they themselves dig (or borrow from plains vizcachas). The rent they pay is in kind - cleaning the burrow of insects and pests. Their diet includes some fish, carrion, snakes, birds, rodents, eggs, fruit and sometimes chicks from the hen-run. Country folk get their own back by eating the tegu's delicious flesh, and using the fat in medicinal cures. The greatest incentive for hunting them is the leather which is used in fine leatherwork of shoes or wallets, belts, etc. At the end of the 80's Argentina exported some three millon hides per year which made it the most exploited reptile in the world.*

El Palmar
National Park

In bygone years the yatay palm *(Butia yatay)* grew all the way south from Paraguay and southern Brazil in corridors flanking the provinces of Corrientes and Entre Rios. "They give the country a wild look; the traveller believes that he has been trasported to the arid plains of Africa" wrote the French traveller Arsene Isabelle in 1833. His countryman Aristide D'Orbigny was also captivated by these slender palms but believed that human population growth would wipe the groves off the face of the Earth.

Time proved him right: by mid XXth century expanding agriculture had left but patches of the species and even the well-known Palmar Grande of Entre Ríos that had captivated Isabelle was in danger. The sandy soil had stopped the plough but not the cattle that grazed the tender palm saplings and thus condemned the future of the grove. But the sandy soil did not stop the advance of citrus, eucalyptus and pine plantations that began to dominate the landscape.

The creation of El Palmar National Park in 1966 prevented the total disappearance of the palms. In the 8500 hectares protected, the main concentration of the Palmar Grande took on a new lease of life. Today it is an island of nature surrounded by cultivation, fields and forestry plantations.

Woodpeckers and woodcreepers climb the trunks of the palms while rowdy monk parakeets build their nests in the crowns. The grasslands below are home to red-winged tinamous, greater rheas, grey foxes, Geoffroy's cats, grisons and pit-vipers. The riverside forests form tunnels where live capybaras, brown brockets, long-tailed otters, raccoons and the wonderful squirrel cuckoo. Mesquite-type woods support red-crested cardinals, brown cacholots, rufous horneros and the blooms of passion flowers. With each rain the low-lying lands fill with duck, herons, jacanas, painted turtles and frogs. Only the pampas deer and jaguar are missing, the first due to cattle's foot-and-mouth disease, the second

El Palmar stream. *Top left corner:* Tropical Screech-owl. *Top left:* Pit-viper. *Top right:* Painted Turtle.

pushed back by the advance of agriculture and rearing of stock.

Four decades of protection have encouraged the return of some of the original residents - between the canvas flaps of tents the tegu lizard uninhibitedly take sun, plains vizcachas beg food from campers' hands and birds share their tables. Such experiences give more meaning to the basic offers of the park. The gentle topography, the variety of habitats and the friendly wildlife make this the ideal place to feel oneself part of nature, part of the Whole.

Over and above all this one can explore a landscape of remeniscences. On the banks of the Uruguay river, south of the park HQ, a circular stone building resists the advance of time and the forest. Other great walls jut from the cliffs and a tunnel mouth yawns towards the river. These are the remains of the Palmar lime-works. Local tradition is borne

El Palmar
National Park

out by archaeological research; it was the Jesuits that worked the calcareous rock. Throughout the XVIIIth century this product was used for working the hides from the Jesuit missions in Paraguay which were exported to Buenos Aires and Montevideo.

When the Jesuits were expelled in 1767 the pits were turned over to the Spanish merchant Manuel Antonio Barquin who reactivated production. Some of the product was responsible for the growth of Buenos Aires with the first buildings of more than one storey, in times of Viceroy Vertiz. Barquin's lime-pit, as thereafter it became known, surfaces periodically in history: in 1811 it was burned by Portuguese troops called in by Viceroy Elio to bring assistance to Montevideo under siege. At the beginning of the XXth century it was again put into operation briefly. Half way through that century it was buried under a loading wharf of a company that exploited the gravel pits. Park protection saved the remains and its interesting history from oblivion.

Useful Data

El Palmar National Park

The park came into being on 28th January 1966 under National Law Nº 16802.

It is in the Espinal biome and covers a area of 8,500 hectares.

The name is derived from Palmar Grande, the southernmost distribution of the yatay palm, and the largest grove in the Province of Entre Rios.
Places of interest are the El Mollar trail, the Palmar lime-works, beaches on the Uruguay river, the Palmar and Los Loros streams' overlooks, La Glorieta. To get there from Buenos Aires, cross the Zarate-Brazo Largo bridge complex, then Rts 12 and 14 to the park entrance (365Km). From Santa Fe or Parana take Rt 18 to Concordia and then 14 southwards (315 Km). From Rosario over the bridge complex to Victoria, Rts 26, 39 and 14 (320Km). From the entrance to the central recreational area there are 12Km of gravel road. The village of Ubajay, 6Km from the park, has bus services from Buenos Aires, Corrientes and Posadas. From there take a rented car with driver (remis) or a radio-taxi. Some busses will let you off at the gate but none pick up passengers there. The entry fee is valid for 48 hours.

For lodging, food and fuel, the central recreational area has a camp-ground, store, restaurant and café; there is a public telephone and one can rent a fire-site. Fundacion Vida Silvestre's Aurora del Palmar private wildlife refuge, across the road from the park, offers camping facilities, a place to eat and lodging in reconditioned railway coaches. In Ubajay, only 6Km away, there are modest hotels and places to eat. Both in Colon (54 km S along Rt 14) and in Concordia (65 km N) there is a wide choice of lodging and eating places. The nearest service stations are (south) at Colonia Mabragaña (26 km) and Ubajay (north), on Rt 14. The climate is temperate with average temperatures of 25°C in summer (maximum around 40°C) and 11°C in winter (some frosts); about 1.400mm of rain falls annually, with greater precipitation in summer months. Any time of the year is good for a visit, but bear in mind that over Holy Week and the winter holidays there are crowds.

Nearby attractions include the Aurora private wildlife refuge where hikes and horse riding excursions are organized in the 200 hectare palm grove, and camping on the Palmar stream. To the north the thermal waters of Concordia await you as does the lake of the Salto Grande dam. South there are thermal baths at Villa Elisa, the Immigrants' museum in San Jose, the historic Forclaz mill and the city of Colon with its beaches, thermal waters and wonderful views of the river.

For more information contact
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Tel (03447) 493053, Fax (03447) 493049,
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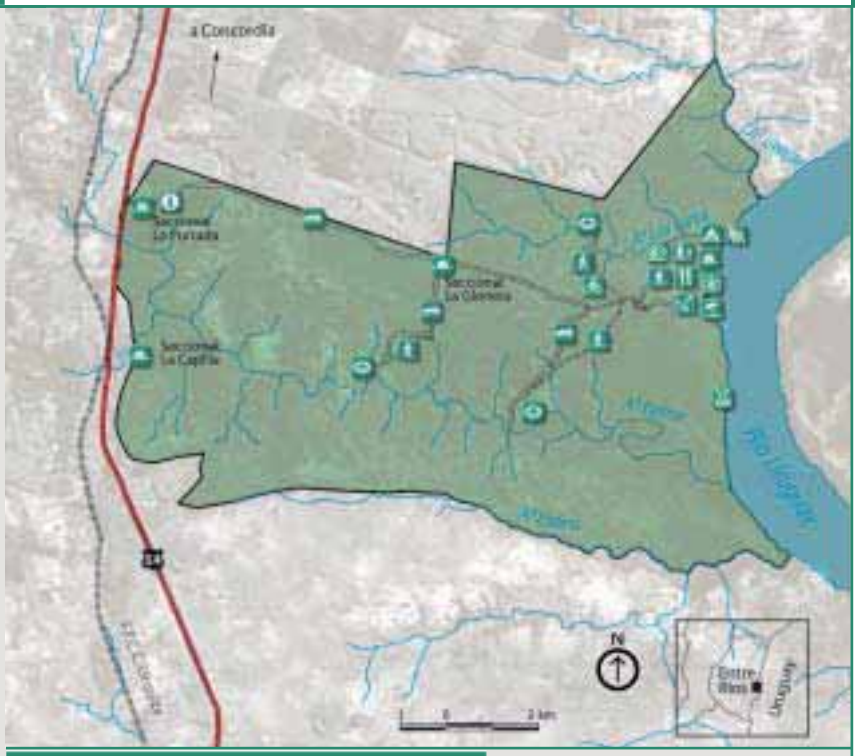


Recreational Activities

Hiking and wildlife observation

There are several opportunities to get on intimate terms with the nature of the park and its cultural heritage. There are roads to reach the Barquin ruins and the beach on the Uruguay river (3Km from recreational area), the Palmar stream overlook (7Km) and the Glorieta, a high point in the yatay palm groves with a viewing point (11Km). Cycle trails also reach the Los Loros stream where capybaras and the long-tailed otters frolic, and a viewing point where the stark difference between the natural area and the neighbouring forestry plantations and cattle farms can be appreciated (5Km).

For hikers there are five exclusive trails. From the camp-ground, the Mollar loop trail (1400m) winds through the transition zone between the riverine forest and the thorny woods. It explains about the main species of tree with a pamphlet which one can ask for at the visitors' centre. South from the park HQ a trail leads to the lime-works; it can be slippery in parts and threads through the riverine forests to the historic site. Wayside panels explain the resources on the trail. Another trail (300m) explores the grasslands and the edge of the forest along El Palmar stream. Yet another trail (1000m) leads from La Glorieta to a different stretch of the stream where there are sandy beaches and a little cascade. A side trail off the same Glorieta trail takes one around one of the denser stands of palms (500m and suitable for wheel-chairs).

While hiking these trails one can meet much of the wildlife that is becoming ever more accustomed to the presence of visitors, especially early in the morning or late evening. Before hiking any of the trails it is as well to visit the interpretive centre where panels will give a foretaste of what to look for (open 8am to 7pm). To see the sunrise or the full moon the best place is on the banks of the Uruguay river, but for sunsets the Glorieta is best.

El Palmar
National Park

Species of Value

The Yatay Palm
(Butia yatay)

This slender palm can reach 18 metres in height but takes eons to do so. It is in no hurry as its life expectancy is around 700 years. Most of the specimens in the park are between two and four centuries old. Each year, as the plant grows in due season, it sheds fronds which leave a scar on the trunk. These help in determining the age of the specimen with certain accuracy. The fleshy fruit has a sweet/sour taste and is an important item in the diet of the monk parakeets, rheas, foxes, the local raccoon and the brown brocket. With the fruit a delicious liquor is prepared, while the fronds are used in basketry. Today the trunks are not used though once they were useful for telephone and telegraph lines. Woodpeckers make their nest holes in them while the narrow-billed woodcreeper spirals up them in search of insects and grubs.

Thanks to fire

The devastating fire in 1979 that the press reported destroyed the national park, permitted the confirmation of something that had been suspected for a long time - that fire helps in the propagation of the yatay palm. The grassland fire barely blackens the trunks of the palms and passes over young specimens that have their growing tip well covered. Fire is unforgiving to bushes and grass and so eliminates the competition for young palms.

With this finding the strict prevention of fires has changed to a programme of prescribed burning. These are useful for the control of bushes that are converting the Palmar into brushland in places, inhibiting the growth of young palms. Cows may also have helped as they grazed the young palms for two centuries, not allowing replacement of the old groves. However, regulated grazing has proved that it is helpful in renewing the palms as has been proved in the national park as well as in neighbouring La Aurora wildlife refuge.

But not all the park's enemies have changed sides. The expansion of invasive exotic species is affecting the biodiversity of the park and the functioning of its ecosystems. The chinaberry *(Melia azedarach)*, originally from the Himalayas, has already taken over more than ten percent of the park's area (900 hectares), together with the white acacia *(Robinia pseudo-acacia)*, pyracantha (crataegus) and ligustrum. The European wild boar not only destroys young palms but disturbs the soil and thus provides conditions for the establishment and invasion of exptic woody species. Controlling these invaders is the main concern of parks technicians.

Vampire Bat
(Desmodus rotundus)

Of the nearly one thousand species of bat in the world this is the only one that is exclusively a feeder on blood. This they get on dark nights, from wildlife (tapirs, sea-lions, brockets, peccaries), from domestic cattle or even from man when in a deep sleep. Felix de Azara wrote "I can bear witness to that as on four occasion I have been bitten on the pad of the toes while sleeping under the stars or in country dwellings". It approaches its intended victim very stealthily, usually on the ground, walking on the knuckles of its folded wing, bites a round hole with its sharp incisors and laps up the oozing blood. There is an anaesthetic and an anticoagulant in the saliva that are its secret weapons so as not to be felt and to keep the blood running. So adept is the vampire that the victim seldom feels anything.

Plains Vizcacha
(Lagostomus maximus)

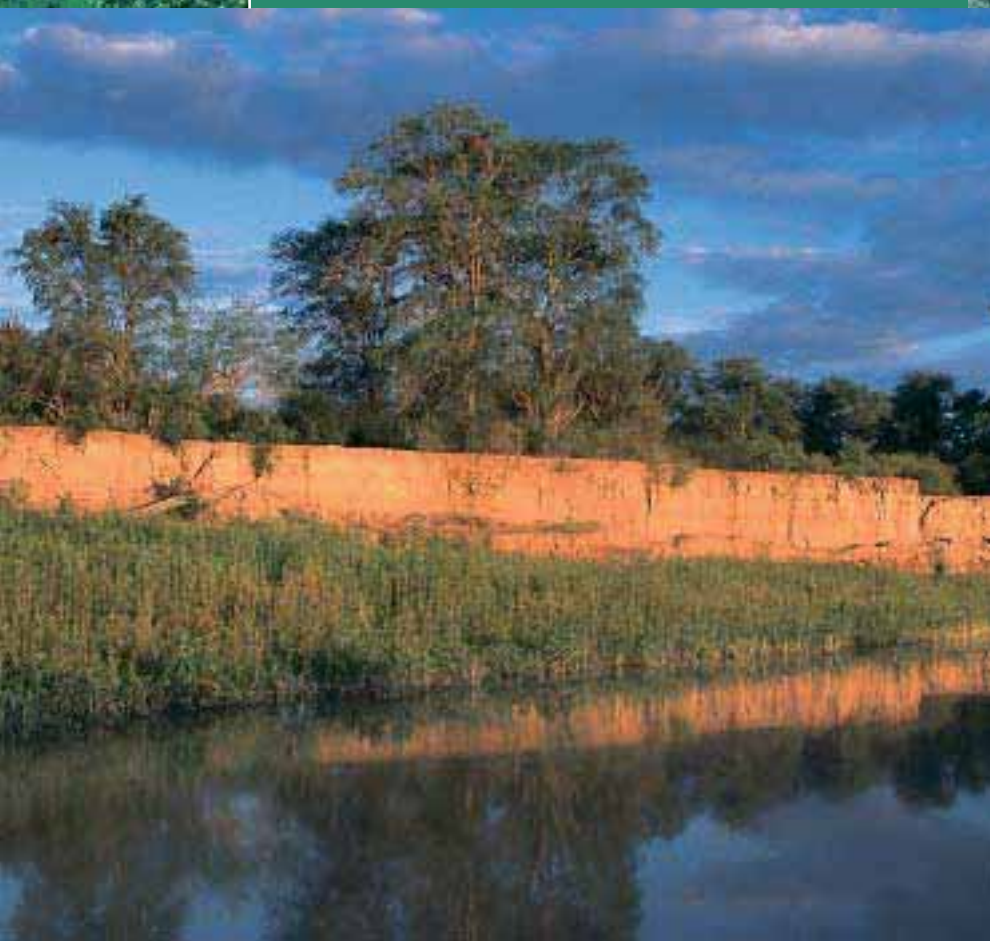
Fourth in size amongst the country's rodents (after the capybara, the Patagonian cavy and the paca) this expert tunneller digs burroughs and long underground passages in colonies that sometimes cover a diameter of 300 metres. Here they live in colonies of many individuals and sometimes share their lodging with grisons, skunks, opossums, tegu lizards, toads and snakes. During daylight hours they remain within the burroughs but at dusk emerge to graze in the vicinity - their appetite is as big as that of an adolescent: it is said that they can eat half their own weight in grass each night. This results in a characteristic bare area around the colony which helps them see distances and look out for approaching predat ors - but at the same time means that they must travel ever further in seach of food.The species has been persecuted for nearly a century as an agricultural pest, and is reduced to the marginal areas of the advancing agro-frontier.

A Park with history

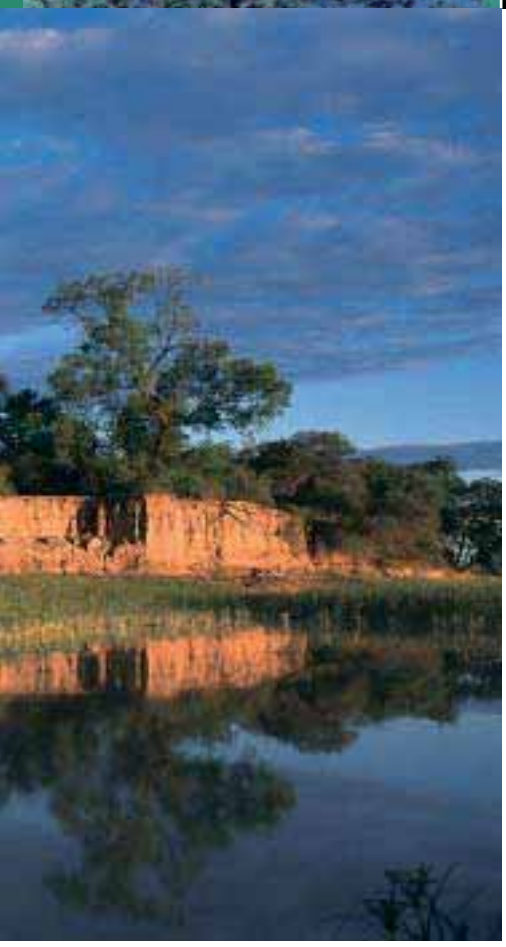
When the Spaniards arrived the region was populated by the Charrua and Chana-Timbu people. They did not hunt the feral cattle, descended from those original animals released on the banks of the Parana river by Hernandarias towards the end of the XVIth century and which had become incredibly numerous. This easy prey attracted all manner of smugglers and wild folk. In mid XVIIIth century, determined to stop this drain on the valuable resource, Pedro Ceballos, the first Viceroy of the River Plate, named his friend Manuel Antonio Barquin overseer of the region. He held the post for barely one year but had not wasted his time. When his successor Tomas de Rocamora arrived, Barquin had already got control of the Jesuits' Palma Grande lands and lime-works. With these he made his fortune exporting quick-lime, hides, dried meat and fat to Buenos Aires, Santa Fe and Montevideo. The feif was acquired in the next century by Justo Jose de Urquiza. The only initiative to exploit the palms commercially dates from that time. In 1857 the firm Arcos, Bilbao and Bragge tried to extract oil from the seed and obtain a "wine" from fermentation of the sweet flesh that surrounds the seed. The enterprise did not survive but left a memorial in the middle of the palm groves: the ruins of the destillery, a strange stone construction. There are also vestiges of the section houses of Urquiza's estate and the homestead built by his heirs now serves as the park's HQ, the visitors' centre and the restaurant. One can actually feel history in the reign of the yatay palm.

Formosa

Nature Reserve



The fauna of South America retains a not inconsiderable number of primitive forms, prodigious creatures whose lines of descent managed somehow to cheat the contingencies that condemned other branches of evolution to the realm of paleontology. One of these is the giant armadillo (see p 104), descendent of those glyptodons that Ameghino exhumed from the dust of the vast Pampas and whose enormous shells are today to be seen in natural history museums the world over.
There were no armoured mammals in the zoological repertoirs of Aristotle, Pliny or Claudius Aelianus that were still current at the time of the Spanish conquest of South America, and certainly not of unusually large sizes. It is understandable that the giant armadillo was believed to be a mytical beast in the legends of the indigenous people. It came to light under Felix de Azara, a Spanish official, whose reading of Buffon, coupled with his sharp power of observation, transformed him into the greatest colonial naturalist in our America. His notes on the natur-



Left: Banks of the Teuco or Bermejo river. *Top left corner:* Teuquito river. *Top left:* Black caiman. *Top right:* Bottle-tree.

al history of Paraguay and the River Plate were published in 1801 and 1809. Only a century and a half later this giant armadillo was listed as in danger of extinction. To save it from this end, the Formosa Nature Reserve was created.

The Province of Formosa ceded to National Parks the jurisdiction of the area in compensation for a severe reduction in the size of the Rio Pilcomayo National Park. The area was not in any state deserving to be included in the system of national parks because of the degradation brought on by selective logging and uncontroled livestock breeding. For this reason was established the "nature reserve for a specific end", a strict measure for the protection of an area, chiefly for scientific research. The idea was to fence the whole area for the study of recuperation of the habitat and establishment of norms for careful management of the regional biodiversity.

Nothing was done in this respect. It was only in 1986, eighteen years after its creation, that the reserve got a custodian in the person of a National Park Ranger. By then it had been split in two by a canal for taking water from the Teuco river to Yema lake, a slash thirty metres wide and five kilometres long. However, the area soon recovered its original aspect thanks to the incredible capacity of the Chaco's habitats. Today, between the Teuco or Bermejo river and the smaller Teuquito, there exists a viable representative sample of the Dry Chaco.

The greater part is covered by the open woods of medium height, dominated by the red and white quebrachos. There are also yuchan "bottle trees" ***(Ceiba insignis),*** itin (a leafless ***Prosopis***), mistol ***(Zizyphus mistol)*** and enormous cactuses such as the ucle ***(Cereus validus)*** and a columnar species. Also the palo santo ***(Bulnesia sarmientoi)*** the lovely wood of which has led to its downfall, that grows in

Formosa
Nature Reserve

almost pure stands in low-lying lands. Rt 9 that crosses the reserve, provides vehicle access to one of these pure woods. On the riverside levées and around the oxbows of former river channels, the woods become denser with the addition of palo amarillo *(Phyllostylon rhamnoides)*, white algarrobo (Prosopis alba) and others. One has a trunk that is used in the manufacture of the "league drums" that can be heard a league away. In places occasionally flooded by the Teuco river breaking over its banks there grow the river "alder" *(Tessaria integrifolia)*, the native willow *(Salix humboldtiana)* and coral trees.

According to reports, these woods and the waters adjacent are home to more than 370 vertebrate animals amongst which is the fishing bat, the turquoise-fronted parrot, a tree-climbing lizard of cryptic colouration, and the threatened tapir, giant anteater, long-tailed otter, boa constrictor, broad-snouted cayman. And what about the giant armadillo? It has been seen but is still very rare. To ensure its survival in the region it is urgent that the neighbouring Teuquito Provincial Reserve be implemented (14,960 hectares). In this way the whole of the watershed of that smaller river is protected against erosion and thus the life of the Yema reservoir will be extended. It gives water to a number of settlements and large agricultural enterprises in western Formosa province.

Useful Data

Formosa Nature Reserve

The reserve was created on 27th September 1968 under national law Nº 17,916 and is in the Dry Chaco eco-region. It protects 9005 hectares and derives its name from the province which in turn got it from the settlement on the bend in the river Paraguay founded by Commander Luis Jorge Fontana in 1884, known since the 16th century as the Formosa (or hermosa - beautiful) bend. Points of interest are th recreational area with its camp-ground and hiking trail and the palo santo woods on Rt 9, towards El Azotado. To get there from Formosa city head west along Rt 81 as far as Ingeniero Juarez, then Rts 39 and 9 to the recreational area of the reserve (519Km - the last 222 being on dirt roads). From the Salta province localitry of Embarcacion, east along Rt34 and 81 to Ingº Juarez and 39 to the reserve (334Km - the last 210 are dirt). One can reach Juarez in a minibus from Las Lomitas (Formosa province) and Embarcacion, in Salta province. These are both served by bus lines and connections to the rest of the country. In Juarez it is possible to hire a pick-up with driver to cover the last 65Km to the reserve. No entrance fee is charged. For lodging there is a camp-ground in the recreational area of the reserve with bathrooms, tables, fire-sites and showers. Some of the neighbours may sell you a young goat - suitably dressed, or fresh fish from the Bermejo in due season. Juarez has hotels, restaurants, supermarkets and service stations. The climate is semi-arid subtropical with a dry season in winter and great daily temperature variation. The average winter temperature is 12ºC (with occasional frosts) and 25ºC in summer (absolute maximum 48ºC). 350 to 750mm of rain fall each year, during the summer. The best time to visit is May to September. Otherwise it is too hot and earth roads are cut by rain. Nearby attractions include the lake at Yema reservoir, some 12,000 hectares for sailing, fishing or wildlife observation (88Km from Juarez along Rts 81 and 37). La Estrella swamp, one of the most picturesque wetlands of Argentina (207Km from Juarez along Rts 81 and 28 to Posta Cambio a Zalazar). Thermal water have been found in Juarez which may become another regional attraction.

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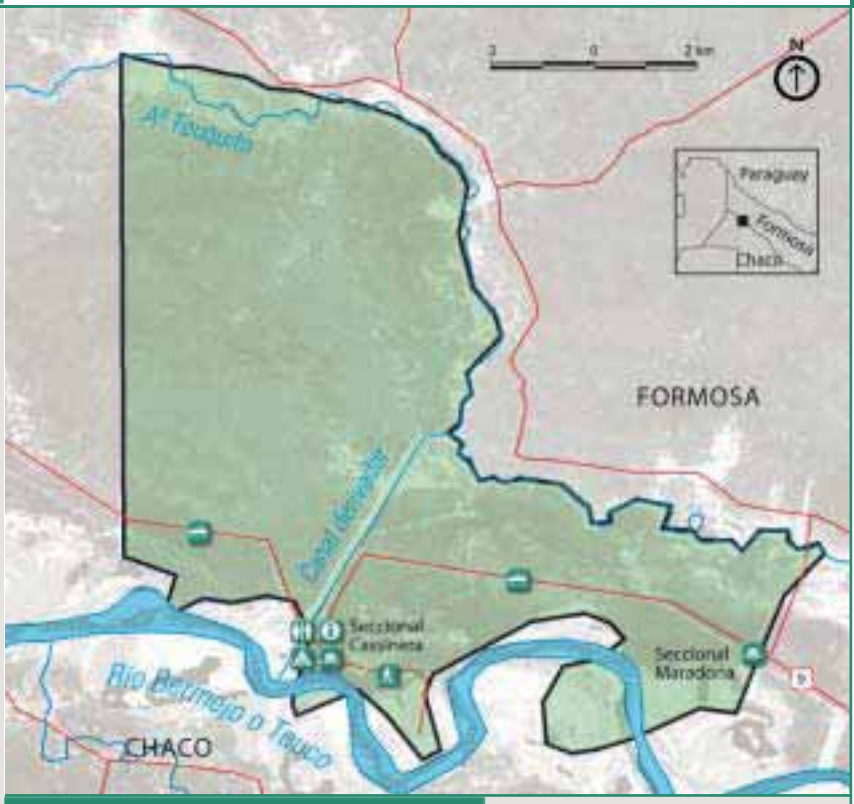


Recreational Activities

Hiking and plant recognition

Self-guided, with a pamphlet, the Monte Adentro trail identifies the main botanical species in the reserve, from shelf fungi to the imposing red quebracho. Along the trail one can appreciate the seclusion of an oxbow lake and its inhabitants, wonder at the dimensions of an centenarian algarrobo that miraculously survived the logging, and admire the copses of coral trees, native willows and river "alder" (not an alder at all) that grow with the flooding of the Teuco river. To meet a timid brocket, a capybara, a fox or stately black-legged seriema may be a question of luck, but it often happens.

What we can guarantee are the woodland maras that are extremely common around the camp-ground. Here starts (and ends) the trail. Its 5200m take about a couple of hours to walk but an alternative is the short-cut home about half way (50 minutes). Take a hat, comfy footwear and plenty of drinking water. It is best during the morning or late evening. When the sun is at its zenith it is siesta time, or the best time to enjoy the beaches on the Teuco river.

Formosa
Nature Reserve

Species of Value

Giant Armadillo *(Priodontes maximus)*

Its sixty kilos and metre and a half in length make it the largest living armadillo. "It is so strong and robust that it can easily carry a man mounted on its back" noted Felix de Azara in his Viajes por la America Meridional (Journeys through southern America). Of solitary habits it spends the day in the shelter of some fallen tree or in its enormous den that it digs in places never reached by flood waters. At night it sorties in search of food - ants and termites - though it does not spurn other insects, spiders, reptiles and even carrion. The hard armour protects head, sides and back, like a medieval knight's. Its weapons are the enormous claws for digging. But they are no use against his chief enemies - deforestation, hunger and those who collect curiosities. It is no surprise that the "tatu guazu" of the Guaranis has two feet in the Dry Chaco and two on the list of critically endangered species.

The Boa Constrictor
(Boa constrictor occidentalis)

Known locally as the Lampalagua or Boa de las Viscacheras, this snake can be some ten feet long and weigh over fifteen kilos. It is typical of the Dry Chaco, spending the cooler months in lethargic hybernation in some burrow, so it can only be encountered from the middle of spring to mid-autumn. It kills its prey by asphyxia by wrapping it in coils and squeezing it after a patient ambush. It seems that it does not feed on plains vizcachas as one local name might imply, but simply uses their compound social burrows to take refuge from the sun or digest its meals, which might take days. Its menu includes ground birds, small rodents and even the odd fox cub, and in this it fulfills its role of controller of species considered pests to agriculture. In spite of its usefulness it has been persecuted without pity for its skin that is much sought after for fancy leatherwork because of the small scales and attractive design. Since 1987 it figures on the list of species whose international trade is forbidden. Today its chief concern is the loss of its habitat as the agricultural frontier expands.

Conejo de los Palos *(Pediolagus salinicola)*

Parece una versión miniaturizada de la mara o liebre patagónica, con los ojos ostensiblemente delineados de blanco. Puebla los ambientes áridos y semiáridos del Gran Chaco, desde Bolivia y Paraguay hasta el noroeste de nuestra provincia de San Luis, donde coincide con la mara. Menos gregario que su prima, vive en pareja o formando un reducido clan familiar alrededor de una cueva poco profunda que él mismo construye. Para ramonear la vegetación arbustiva, su alimento básico, se yergue a veces sobre las patas traseras. Algunos autores le adjudican también la costumbre de treparse a árboles bajos o caídos, capacidad que habría originado su nombre común. Pero no hay lugareño ni evidencia científica que corrobore la afirmación. Lo cierto es que la especie revista entre los recursos de subsistencia para la población rural del Chaco Seco, aunque no aparenta tener problemas de conservación.

A full life

Around the Formosa Nature Reserve there are four Wichi communities (those who participate of a full life). Lacking the war-like qualities of the Guaycurus and Ava-Guaranis (Chiriguanos), the Wichi opted for resisting the white man's expansion by taking to the depths of the Chaco wilderness. They have not done badly. "By retiring to their very humble hamlets" says the anthropologist Carlos Martinez Sarasola, "they were able to keep many of their ancestral practices, and defend themselves from being exploited and against the diseases brought in by whites against which they had no resistance".
Today, as before, they endeavour to live by hunting, fishing and gathering algarrobo seeds and wild honey. They use the very lovely woods provided by the Chaco to carve beautiful birds and animals, and use the fibre of the chaguar (a ground bromeliad) to weave the "yica" purses that once were all the rage in Buenos Aires. They keep their language, their traditional organization and many of their beliefs and myths. They still are guided by the values that were dear to their ancestors, such as the harmony that exists between man and nature.

Subjugation, marginalization and hunger have not been able to master the Wichi people. It was to be expected. Every November, Nilataj (eternal principal of a full life) makes plants give fruit and fills the rivers with fish. He is not going to forget his favourite sons!

Yuchán *(Ceiba insignis)*
(the "drunken" bottle tree)

Of our "bottle trees" the one that corresponds to the Dry Chaco is the one with yellow flowers, the yuchan. "Rotund father of the woods" according to the poet Jaime Davalos, it resembles the baobabs of African savannahs to which it is related. The drum- or barrel-shaped trunk (bottle-for some), permits it to survive the droughts with its good reservoir of water. The Chaco Indians had only to hollow it out to make drums, one-trunk canoes (called "cachiveos" in Formosa province) and large vessels for storing "chicha", the alcoholic beverage drunk at their celebrations. With the porous wood the Chane people of Salta's portion of the Dry Chaco carve masks that they wear in their "arete" (real time) celebrations, or sell as handicrafts. Infusions made with the flowers are used to alleviate headaches, that of the thorns for eye-troubles. The bark is for wrapping bundles of tobacco leaves and for making ropes. The "cotton" from the ripe seed-pods stuffs pillows and matresses. Its blooming from January to July, breaks the monotony of the Chaco woods with brush-strokes of colour.

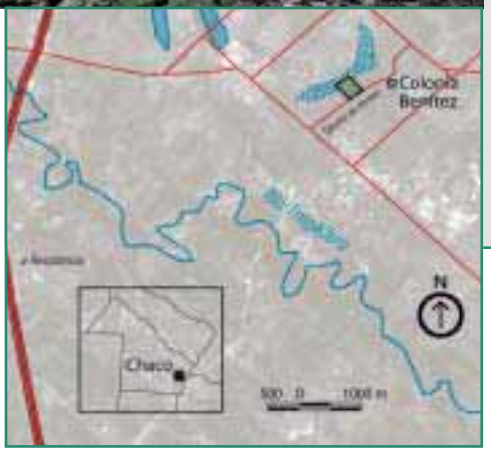
Colonia Benítez

Educational Nature Reserve

Interior of hardwood woods. *Top left corner:* Orchid. *Top:* Augusto Schulz House-Museum.

This educational reserve lies within the former property of the INTA (National Institute of Agrarian Techniques) experimental station at Colonia Benitez, near the city of Resistencia, capital of the Chaco province. It is a pocket-sized sample of the Wet Chaco biome. In its barely ten hectares it contains small patches of the main habitats of the eco-region, a valuable asset in itself. Dominant is the sample of "strong" woodland with even a pure stand of red quebracho trees. On the old levées grows gallery forest with the crowns of the trees all tied together with lianas, climbers and ferns. A small marsh occupies the lowparts and is covered by abundant acquatic vegetation. There are even small patches of grassland.

Within this small reserve 278 species of plants have been recorded, as well as 203 vertebrates. Amongst the tallest trees, apart from the quebrachos already mentioned, is the ibirapyta ***(Peltophorum dubium)***, the black ear tree ***(Enterolobium contortisiliquum)***, two species of Tabebuia, guaranina ***(Bumelia obtusifolia)*** and the urunday ***(Astronium balansae)***. Because of the limitations of the space there are no important populations of animals in the reserve. Crab-eating foxes, brown brockets, capybaras, howler monkeys, toco toucans, caciques, hummingbirds, and the two species of cayman are seen in the diminutive reserve. It is also the only site within the system of national parks



Useful Data

Colonia Benítez Educational Nature Reserve

The Educational Nature Reserve was created on 10th October, 1990 by National Law Nº 2149 under the figure of a Strict Nature Reserve. It became the Educational Reserve in 2002 by National Decree Nº 1798. It is in the Wet Chaco biome and covers an area of ten hectares. The name is taken from the colony founded in 1888 by Manuel Benitez and nucleus of the neighbouring village and INTA experimental station. The capital city of the Chaco receives bus services from all over the country and daily flights from Buenos Aires. To reach the reserve any hired car will do, with or without driver, or through the services of tour agents. There is a regular bus service between Resistencia and Cnia. Benitez village, neighbouring the reserve. No visitors are allowed at present. Resistencia has all manner of services but Benitez itself only a grocer's store. The climate is damp subtropical with a dry season (April to October). Yearly mean temperature is 21ºC with summer maximums of over 40º and occasional frosts in winter. The annual rainfall ammounts to between 900 and 1100mm, almost all falling in summer months.

that is home to a tiny frog *(Pseudopaludícola boliviana)*. In the midst of an area which has been totally altered by agriculture and urban spread, this reserve has the character of a Noah's Ark

The reserve is the result of the passion, dedication and perseverance of Augusto Schultz, a self-taught botanist, who fell in love with the local nature. He it was who convinced the INTA to preserve a sample of the original Chaco woods that were being felled before their very eyes. Not satisfied with that, he set about a complete inventory of the plant species on the place and had the province declare Colonia Benitez the botanical capital of the Chaco. Because of his tireless efforts the University of the NE recognized his labours in presenting him with an honorary degree. He died in 1992. The Resistencia Natural History Museum bears his name.

San Antonio

Strict Nature Reserve

On the outlying ridges of the Victoria range, 500metres above sea-level, San Antonio protects one of the last remaining stands of the Parana *Araucaria* pine in Argentina. This species is known to the Guaranis as curi-y, to lumber men as Parana or Brazil pine, and to botanists as *Araucaria angustifolia*.

With a crown like an inverted umbrella and a straight and cylindrical trunk covered in plaques, this tree can reach forty metres in height. It is of ancient origin having grown in times of the dinosaurs during the Jurasic era. It reigns in southern Brazil on the Serra do Mar and forms the scattered woods of the Planalto. In our country it only grows in the NE of Misiones province. Up in the sierra it is joined by the Guatambu Blanco *(Balfourodendron reidelianum)* and Laurel Negro *(Ocotea acutifolia)* to form a district within the Paranaense Rainforest known as the Pinares.

Originally the Pinares covered some 210,000 hectares but today there are barely one thousand left standing. It is no accident that this species is at the head of our list of endangered trees. Its extinction would leave a handful of dependant species without habitat or food such as the acrobatic araucaria tit-spinetail, the vinaceous-breasted parrot, the red-spectacled parrot and the red howler monkey, all of which are listed as threatened. Further, it would close the genetic bank for commercial forestry of this species on which to have recourse in times of disease or a possible loss of vitality.

In 1986 the Province of Misiones declared this species a

Useful Data

San Antonio Strict Nature Reserve

The reserve was created on 18th October 1990 under decree Nº 2149. It protects a specific community of the Paranaense or Misiones Rainforests. The name is that of the village of San Antonio 5 kilometres away. There is no public visitation allowed. The climate is subtropical with no dry season, and average temperatures of 25ºC in summer, 14º in winter. Annual rainfall is between 1600 and 2000 mm, spread evenly throughout the year though there is slightly less in the months of June and July.

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Natural Monument and imposed severe fines for felling it, as also all commerce and destruction of natural specimens. The measure did not contemplate the surrounding forest and the araucarias were left, standing alone, unprotected and upright, like posts, in tobacco or tung plantations. More effective by far was the measure taken years later with the creation of the Urugua-i, Araucaria and Cruce Caballero provincial parks and the San Antonio Strict Nature Reserve.

The 450 hectares of the reserve were once protected on land of the National Forest Service which worked with native and exotic species of lumbering potential. In 1990, when the Service was dissolved, they passed under the protection of the National Parks Administration and were given the maximum degree of protection. The araucaria groves, with tree ferns, naturally growing Yerba Mate trees *(Ilex paraguariensis)* are home to some 250 species of vertebrate amongst which are the vinaceous-breasted parrot and the araucaria tit-spinetail - exclusive to this habitat, as also are the rare striped mouse and the Misiones wailing frog, and the threatened ocelot, tapir, solitary tinamou and black-fronted piping-guan. A noteworthy cast of wildlife, especially considering the small dimensions of the protected area.

Pre Delta
National Park

Once upon a time the islands at the mouth of the Parana reached the sea and the labyrinth of channels flowed out between them. But six thousand years ago the sea rose and invaded, reaching where Rosario is today, and on the way washed away all the silt islands. Ever since then the Parana's delta has been gaining lost ground. Today it occupies some 17,500 square kilometres, half the size of Holland, and its islands have grown as far as San Fernando. The city of Buenos Aires watches it approach at some 35 metres per year. In two and a half centuries, if the greenhouse effect does not spark another maritime invasion, the luxuriant vegetation will have reached the General Paz avenue that circles the city.

Using as building material the silt washed down from the Andes mountains and Brazilian shield, the Uruguay and Parana rivers are constructing a natural region with unique characteristics. Its singularity is not based on endemic life forms - there are but five - but on the general whole, a sub-tropical wedge splitting the Pampas plains in two. What is it that gives it its peculiarity? The mass of water moderates the temperatures and provides humidity more like the sub-tropics than the surrounding areas. But the real difference is in the penetration of species from the Chaco woods and Paranaense

White-necked Heron. *Main photo:* Las Mangas stream. *Top left corner:* Water Hyacinth flower. *Top right corner:* Victoria Regia water-lilies.

Rainforests that arrive along the corridors opened up by the great rivers. To these are added those of the surrounding temperate grasslands. Together they form the varying biological communities that give the region its peculiar character.

The delta is a vast mosaic of wetland habitats and open water, responding basically to its dynamic evolution and the fluctuating water-levels. Generally, on the higher land that is only occasionally under water, there are woods and forests with greater or lesser structural complexity and variety. In the lower-lying areas that are nearly always under water, meadows and grassland of various species and height. In between, where flood waters are common but not permanent, there is a transition vegetation. This, however, is not immutable. Such floods, or rises in water-levels due to strong SE winds piling up the shallow River Plate, and even the influence of the tides keep the delta in permanent change. Today's image will be very different from tomorrow's.

The upper reaches of the delta are a few kilometres south of Diamante (Entre Rios province) where the great Parana swings over to right side of the valley, leaving on its left shore a flood-plain cut up by a dendritic pattern of meandering drainage channels. It is here that the Pre-Delta National Park's 2,458 hectares lie. The protected area covers only two islands - the "del Ceibo" and the "de la Manga". But a complex pattern of channels, streams and marshes gives the area the appearance of an archipelago.

There is no better place to get a good look at the area than from the Azotea, a high forested bank humming with thrushes, doves, sayaca tanagers and red-crested finches. The islands are contained within levées and have depressions in their centres, with lagoons ornamented with giant water-lilies *(Victoria regia)*

Pre Delta
National Park

and thus are like gigantic shallow bowls. On the levées grow native willows, black-ear trees *(Enterolobium contortisiliquum)*, curupìs *(Sapium haematospermum)*, river "alders" *(Tessaria integrifolia)*, with the occasioanl coral tree, our national flower *(Erythrina crista-galli)* in which the rufous hornero, our national bird, masked gnatcatchers and the chequered woodpecker sport. On the down-slope behind the levées are the thorny but open acacia woods, followed by tall grasses, then the band of duraznillo (*Solanum glaucum* - a woody single stem with a top-knot like a diminutive palm) till one reaches the almost permanently innundated heart of the island, the realm of the ringed kingfisher, the emblematic species of the park, and a multitude of southern screamers, ducks, herons, storks, coots and white-faced ibis. In the taller grasses (used for thatching) capybaras and coypus rest up by day, and several species of marshbirds roost by night. The champion opportunists - the red water-possum and Geoffroy's cat - take advantage of the habitat's generosity. In the waters swim many species of fish, including the dorado *(Salminus maxillosus)*, several huge catfish, and the threatened long-tailed otter. There is even a small relictual population of the broad-snouted cayman in the park, a species thought to be extinct in the delta region.

Useful Data

Pre Delta National Park

The park came into being on 19th December 1991 under national law Nº 24,063 and covers an area of 2,458 hectares of the Parana river's islands and delta. The name follows the criteria of specialists who considered Pre-Delta as the beginning of the upper delta. Points of interest are La Jaula where there is a camp-ground, hiking trails, where launch excursions embark, Las Mangas (for disembarking, hiking trail, overlook) and La Azotea (panoramis view of the park). To reach the park there is a dirt road south from Diamante to La Jaula, the point of entry (4.5Km). Diamante is 440Km from Buenos Aires, crossing over the Zarate-Brazo Largo complex (Rts 12 and 11); from Rosario over the bridge to Victoria, then Rt 11 (146Km); from Santa Fe through the tunnel to Parana, then Rt11 (75Km); or 45Km south of Parana on Rt 11. The bus station in Diamante has services (or connections) from all over the country. From there to the park take a taxi or rented car with chauffeur (remis). No entrance fee is charged. The park's recreational area, at La Jaula, has a camp-ground with electricity, bathrooms, fire-sites and tables. In Diamante there are hotels, bungalows for rent, restaurants and other places to eat, supermarkets and service stations. The climate is humid temperate with average summer temperatures at 23ºC (maximum over 40º), 13ºC in winter, with occasional frosts. Annual rainfall is between 800 and 1020mm and falls mostly between January and May. SE winds raise the water-levels in the rivers and streams. Autumn and spring are the best times to visit, with pleasant days and cool nights. Rains sometimes cut the road to the park. Nearby points of interest are the villages between Diamante and Parana, settled by the Volga Deutch (Protestante, Valle María, San Francisco, Spatzenkutter, Salto y Brasilera). To the south Victoria awaits, the "city of window-bars" with its benedictine abbey, tourist estancias and river excursions.

Recreational Activities

Launch excursions

The river bank at La Azotea, no distance from Diamante, offer a panoramic view of the park framed by the foliage of riverside trees. From the camping area at La Jaula, a trail which is conveniently sign-posted, leads through willows and river "alders", to the overlook at Las Piedras lagoon (450m).

One can also visit the Curiyu and Irupe lakes over a brand new walkway (300m). But the main attraction is boat excursions amongst the islands. These depart from the jetty at La Jaula on week-ends and public holidays, after 3pm. For arranging other times and days call 0343-156206223. Excursions are accompanied by a licensed guide and take either 40 minutes, an hour and a half or two hours and a half. The longest of these reaches Las Mangas at the northern end of Ceibo island where one disembarks to visit the Los Baños lagoon, often covered with giant water-lilies, and have a view of the surrounding area from a look-out tower.

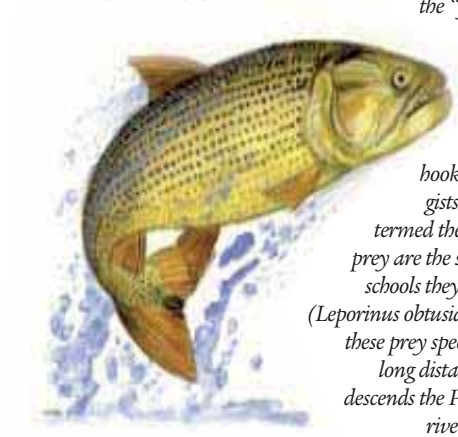
River Gauchos

The Entre Rios delta is no longer the refuge of those wild gauchos, assailants, wastrels "of doubtful pursuits" that Friar Mocho described in his ***Viaje al país de los matreros*** (Journey to the land of kaves) though the water maze of channels, streams and vegetation are still a protection for this land apart, with its own ethics and disconcerting nature. Here live landless natives and the descendants of immigrants (*"stranded by life"*, in the words of the writer Lobodón Garra), who tend other people's cattle and, with luck, some heads of their own, skin what they hunt, spear fish, collect wild wasp honey, uderstand the language of the river's currents and believe in ghosts and such, as they did a century ago and will do for ever.

Their huts of mud and straw crown the levées and are at considerable distance one from another. They never lack a stool or a welcoming "maté" for the visitor, or a canoe, their "most valuable possession". "In the islands one can live without a hut, without clothes, without firearms, without a family; but not without a boat which is home and horse at the same time" was the correct observation of Friar Mocho. "A man on foot is a nobody" the islanders themselves assert.

Lords of the oar and the punting pole, these sailors dressed in gaucho clothes trust more in their boat and their skill with the oars than they do in launches that are useless for entering the shallow marshes and penetrating the dense vegetation of the channels. From their boat they fish, in it they fetch provisions, move house, spread gossip and news (cattle drives and corralling for working over, the arrival of the school-teacher or a priest) and when it is necessary challenge the fury of the river and its floods. Some there are who were actually born on the bottom-boards of a canoe.

Species of Value



The Dorado *(Salminus Maxillosus)*

Amongst the Wichi people of the Dry Chaco, this is the "father of all fish". For the commercial artisan net-fisherman on the Parana it represents up to thirty kilos of valuable merchandise. Sport fishermen call it the "tiger of the rivers" for its fighting qualities and the imnpressive leaps it performs when hooked. The nickname does not displease biologists. Like the great cat on land, this fish can be termed the super-predator of the waters. Its favourite prey are the sabalos ***(Prochilodus platensis)*** *on whose schools they prey as a team, but it does not shun bogas (Leporinus obtusidens), catfish or even little fishes. Following these prey species and for spawning, the dorado migrates long distances. In the area we here cover, in spring it descends the Parana to the Plate and the lower Uruguay rivers and returns upstream in early autumn. Displacement of 1500Km has been recorded.*

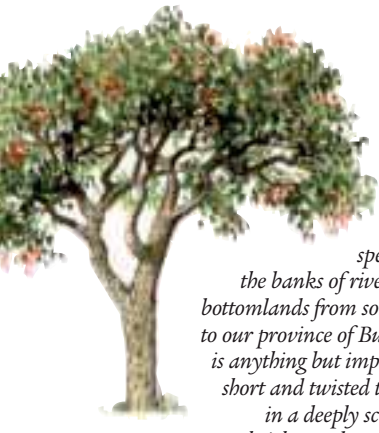
Coypu *(Myocastor coypus)*

The Mapuche people called it "coypu" while the Guarani name is "quiyá" but the Spanish conquerors associated it with the otter in their home country and misnamed it "nutria", strictly a carnivore, and the misnomer stuck. In fact it is a large (6.5Kg) water rodent of strictly herbivorous diet. The species' abundance and its fine pelt made it our fur-bearing animal ***par excellence****. The harvest of pelts has been in the order of 4.5 million per season, coming mainly from the delta and Pampas lakes. Once cured, they are exported. This figure makes the coypu our most important resource from fauna, together with the two species of tegu lizard. In spite of this, the size of the harvest is still not based on research that would guarantee its sustainability.*

In bygone times

Shortly before the Spanish conquest the Guarani people had reached the delta in search of their ideal "land without evil". There were already the straw huts of the formidable boat-people, the Chana-Timbu whose economy was based on fishing. They also hunted and gathered, especially honey. The Guarani influence added primitive agriculture (based on maize and pumpkins), residing in hamlets, and pottery of animal motifs of particular charm. One group of these people, it appears, were lords of these islands that are today included in the park.

With the establishment of Spanish power they became part of the royal concession given to Hernandarias, the first locally-born governor of the River Plate. Through these lands ran the "King's Highway", that main crossing of the Parana to the Santa Fe lands in colonial times. It is no coincidence that in 1851 it was from nearby Punta Gorda that the troops of Urquiza set out on their march that would topple Rosas. Later it was to be the port of Diamante that received the immigrants from all over Europe who covered the uplands of Entre Rios with ears of cereals and left the greenery of the islands for the breeding of cattle.



Coral Tree *(Erythrina crista-galli)*

A leguminous tree, of the same family as beans, this species grows on the banks of rivers and in wet bottomlands from southern Brazil to our province of Buenos Aires. It is anything but imposing, with its short and twisted trunk covered in a deeply scored bark. Its height can be termed humble though it stretches upwards when in close company. The crown is an example of untidiness. However, few of our ornamental trees are as popular as this species. The secret lies in its bright red flowers that both Argentina and Uruguay have chosen as the national flower and inspired its botanical name that means "red cock's-comb"

Mburucuyá
National Park

When history repeats itself it is not always a bad thing. On 6th November 1903 Francisco P. Moreno donated three square leagues of wonderful Andes mountains to the Nation ("the most interesting mix of natural scenic beauty that I have seen in the whole of Patagonia"). These made up the core of our first national park, the "del Sud" that is today's Nahuel Huapi. Nearly 90 years later, again in November, but of 1991, the Danish botanist Troels Myndel Pedersen repeated Moreno's gesture. Seeking to provide yet another shield for the natural places of this country, he donated his two estancias in Mburucuya (Santa Teresa and Santa Maria) in the colourful NW corner of Corrientes Province, to the National Parks Administration.

On the 27th of June 2001 this legacy became Mburucuya National Park. The 17,600 hectares cover an amazingly diverse mosaic of habitats where some 1800 species of plants and animals live. It is like a pocket version of the Mato Grosso's Pantanal.

Before settling into its present course, the great Parana river cut diagonally across northern Corrientes province, headed SW, and formed a vast inland delta. Evidence of that time is the land-

One of the 107 lakes in the park. *Top left corner:* Passion flower. *Top:* Wattled Jacana. *Below:* Marsh Deer.

scape with sand-hills, marshes and lakes that clutter the west of the province and in the biogeographic sense, form part of the Ibera marshes. The Mburucuya park protects a restored sample of this picturesque landscape where the reed-beds, the floating mats of water hyacinth, and drifting islands of floating grass (embalsados) that are typical of Ibera, here interplay with stable vegetation on land of the neighbouring eco-regions.

There are woods that are typically of the Chaco, with the red quebrachos, acacias, white palms and impenetrable ground bromeliads. The Paranaense (Misiones) rainforests are also present in islands of forest (copses) - locally called "mogotes"- with black ear trees, *Tabebuias*, pindo palms, canes, lianas, climbers and epiphytic bromeliads. The elevations, once islands in the ancient delta, hold a sample of the species of the Espinal: the same yatay palms as in El Palmar National Park According to the Pedersen inventory, in the area grow some thousand three hundred plants, some endemic to the country. The size of this patrimony becomes relevant when we think that in Iguazu and in the Urugua-í Provincial Park - our protected areas with the greatest biodiversity, there are supposed to be around 2000 species of vascular plants.

In animals the variety is no less, in spite of the local disappearance of the glaucous macaw, the puma, jaguar (the last specimen was shot in 1913). Between the gilded hummingbird to the greater rhea there are 331 species of bird recorded for the park

Mburucuyá
National Park

(33.6% of the total Argentine inventory and 95% of the list for the whole of the Ibera marshes). Of mammals there are 45 (13 % of the mammal fauna of the country and 90% of the Ibera list); amongst these there are two stars that figure in the book of records - the capybara is the largest rodent in the world weighing in at some 70 Kg, and the black howler monkey, as the noisiest animal on earth. The 41 reptiles and 31 amphibians in the park represent 14 and 21 % respectively, of the totals of these beings cited for the country. And the 41 species of fish are 11% of all the fishes found in our fresh waters. The total list even notes some endangered species (marsh deer, maned wolf, long-tailed otter, broad-snouted cayman, water boa), or with limited distribution such as the eryngium frog scientifically named in honour of Pedersen, the strange-tailed tyrant and the rufous-rumped seedeater. All this makes Mburucuya an important place to set aside for biodiversity conservation in Corrientes province because, till the national park was created, Corrientes only had one reserve - the Ibera, of 1,300,000 hectares.

Just like Moreno, Pedersen never saw his wishes come true during his life-time. He died on 5th February 2000, nearly one year and a half before the park was created. Just moments before his death, seated in his wheel chair, he had been working on his herbarium. He left us a wonderful national park and an example to follow. To protect that double legacy is our most effective way of expressing our gratitude.

Useful Data

Mburucuyá National Park

The park was created on 27th June, 2001 under National Law Nº 25447 . It is part of the Ibera eco-region and covers 17,660 hectares. The name is that of the neighbouring township that in turn gets it from the Guarani generic name for passion-plants, a genus of climbers that are represented by at least 7 species in NE Argentina. Points of interest are the old Santa Teresa farm homestead, the Che Roga interpretive trail 1.5 Km long and self guided - posts and a pamphlet -, the Yatay hiking trail (4 Km), the Santa Lucía marsh. To get to the park from Corrientes city take Rts 12 and 118 to Saladas then 13 to San Antonio de Mburucuya (the village's complete name) and on along 6 and 86 to the operations centre of the park. Corrientes city has bus services from all over the country and daily flights from Buenos Aires. One can rent a car there, or use a chauffer driven car (remise), contact a tour agency or even board one of the five busses that go to Mburucuya each day, 20 km from the protected area, where there are remises. One can also reach Mburucuya in busses directly from Buenos Aires -with a local transport company - or changing at Saladas. No park entrance fee is charged. For lodging, food and petrol: in the park there is only an open campground with drinking water, picnic tables, fire-sites and bathrooms. In Palmar Grande (15 Km away) there is a store and butcher's shop. In San Antonio de Mburucuya, hostels, free camping area, places to eat, fast food outlets, stores and a petrol station. In Saladas (68 Km) there is a wider selection of such places. The climate is subtropical and damp; the average yearly temperature is 21ºC with maximums over 40 in summer and occasional frosts in winter. Some 1200 mm of rain fall each year, slightly peaking in spring and autumn. The best time to visit is April to October as the summers are oppressive. Nearby attractions include the capital city of Corrientes Province (Corrientes) where there is a rich historic heritage, overlooking the Parana river, that is worth a visit. The imposing basilica of Itati (60 Km from the city), and Mburucuya village itself is host to the National Chamamé Feast (a regional dance and musical genre).

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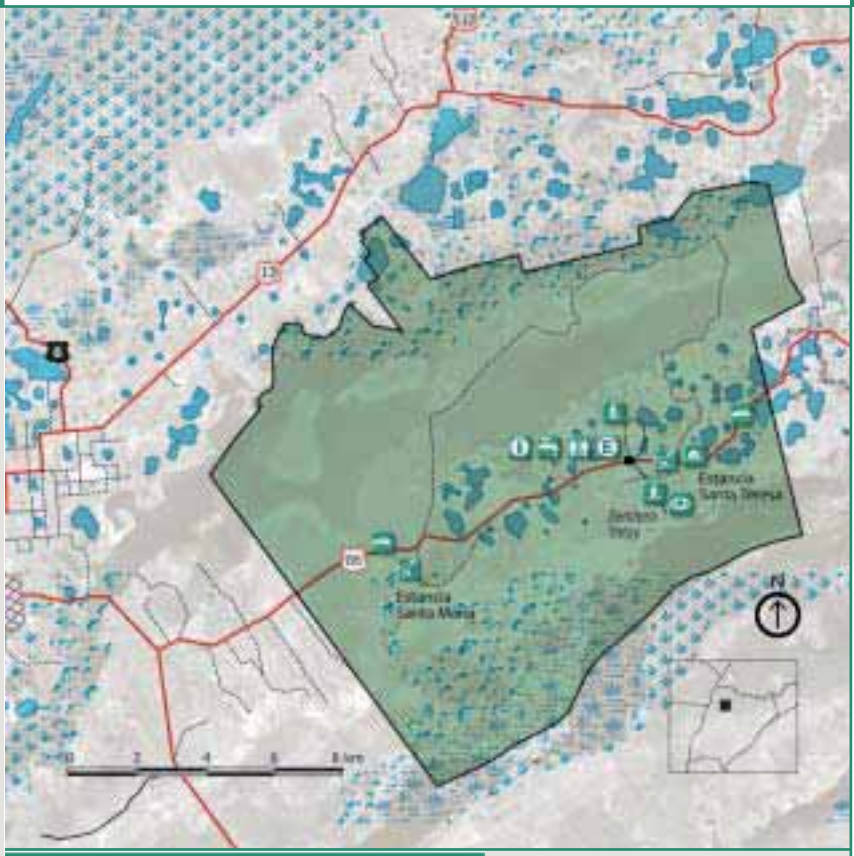


Recreational Activities

Hiking and wildlife observation

The possibilities of coming to intimate terms with nature in the region start as soon as the entrance to the park is passed. On the way to the operations centre, Rt 86 crosses the grasslands of the Santa Maria section of the park where the weird strange-tailed tyrant can be seen - and the meandering Portillo stream - the only watercourse protected by the park - where capybaras, the black cayman and water-turtles congregate. In its proximity one can see some of the 107 ponds in the park and perhaps a greater rhea.

But the real treats are reserved for those on foot. From the information centre the Che Roga ("my house" in Guarani) and Yatay trails start. The first is 1.5 Km long and shows off the recuperating palm groves, woods with brown brockets and the black howler monkeys, ponds crammed with aquatic vegetation, tall grasses that are the home of the shy maned wolf; the other, 4 Km long, leads to a palm grove that is 200 years old and the jetty on the vast Santa Lucía marshes. There one can enjoy the marvellous sunsets, framed by palm trunks. Also watch herons, storks, terns and with a bit of luck, a long-tailed otter or a marsh deer that prefers to come to solid ground for the hours of darkness.

Another site that must not be missed is the old farm homestead of Santa Teresa, built in 1947 under Pedersen's personal supervision. In this large house, over 53 years, the Danish scholar patiently studied the flora of the region and built up his herbarium of more than 30,000 specimens. These visits must be authorized by Park HQ.

Mburucuyá
National Park

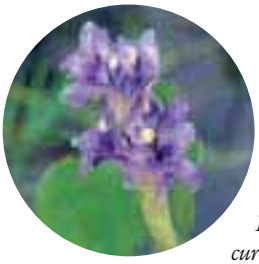
Species of Value

Capybara
(Hydrochaerus hidrochaeris)

This is the largest rodent in the world, over one metre long and weighing up to seventy kilos. Being amphibian in habits it seldom wanders far from water. In the water it is a magnificently stylish swimmer, capable of diving for several minutes and even cross the great, wide Parana. It has "frog's feet" with thick membranes between the toes, and a special fold that covers the ear when under water. Another feature is that nostrils, eyes and ears are in a line along the "top" of its head so that with minimum exposure above water, three senses come into play to detect danger. It even copulates in the water. And on the shore it finds the vegetation upon which it feeds, amongst which it can also hide. Unlike many of its relations it builds no nest or burrow. For defence it trusts in its senses and the watchfulness of others in the pack. Just one member need give the alarm (a hoarse bark, according to Charles Darwin) for the whole group to bolt into the water. The social behaviour of the species is not just a whim.

Greater Rhea
(Rhea americana)

Weighing up o 30 kilos, standing upright it reaches 1.8 metres. This is more than enough to give it the title of "largest bird in the Americas" though not nearly enough to challenge the African ostrich. Unable to fly, it has perfected the art of running at amazing speeds: when pursued it can reach 60 kph (the speed of a galloping horse or a greyhound at full stretch) and without checking its speed, turn abruptly in twisting dodges, raising one wing like a sail to help maintain its balance ("Sailor of the deserts" is what Hudson called it). This disconcerting strategy served it well to avoid being tripped by the bolas that the Indians and gauchos hurled at it to entwine its legs. But today it needs our help to survive the deep changes that agricultural activities have imposed on its former habitat.



The Water Hyacinth *(Eichhornia azurea)*

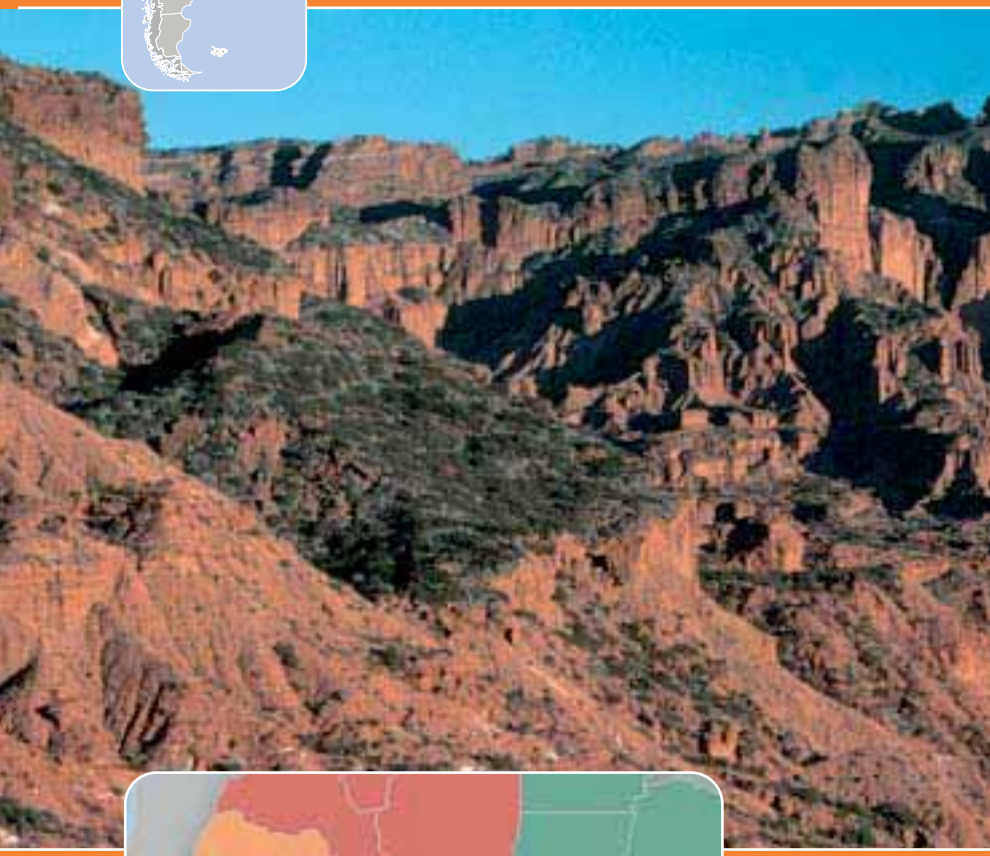
Also locally known as aguapey or camalote, this is one of the most characteristic plants of the rivers and lakes of our NE. It is noteworthy for its capacity to float and drift with currents or winds. This characteristic is shared with but a few families of plants and is facilitated by the chambers of spongy tissue in the stems. It only starts life rooted to the bottom of some body of water, soon to "up anchors" and float away. It flowers and fruits between August and March. The fruit is a longish pod and ripens underwater. Its flowers of a lovely blue purply colour, have led to its being cultivated as an ornamental the world over.
As a result it has the greatest distribution of any water-plant, and that is due to man. It also reproduces through division and its rapid propagation makes it a problem for boating and navigation, especially where it is an exotic and has no enemies. But at home its benefits outweigh its problems. They are shelter and home, even the means of transport, for many forms of animals and birds: jacanas, water turtles, snakes. The plant also purifies the water of reservoirs, produces methane gas, is a good forage for domestic animals, provides compost and fertilizer.
In traditional medicine it is prescribed for many ills. "Fresh leaves covering all the forehead, are a cure for head-ache" according to Carlos Villafuerte, "the juice of the flowers and leaves is a sedative when administered in small doses, in big doses it awakens the sexual desire"

From Copenhagen to Mburucuya

Troels Myndel Pedersen, the father of the national park, was born in Denmark in 1916. When the second world war broke out, he was a lawyer and employed in the Copenhagen law courts. He was kept at his post during the German occupation, but at the end of hostilities that fact paralysed his advancement in his career in spite of the fact that there was no evidence of his having collaborated with the Nazis. Pedersen decided then to emigrate, thinking at first about the Faroes - a Danish archipelago north of Scotland -, but finally opted for a warmer corner of the earth, Corrientes, at Mburucuya, where his father owned two estancias but was too ill to supervise them. He arrived in December 1945 with his wife Nina. He intended to work in the legal profession and dedicate his free time to his passion for botany. But his Danish legal qualifications were useless in Argentina and plants grabbed his full attention.

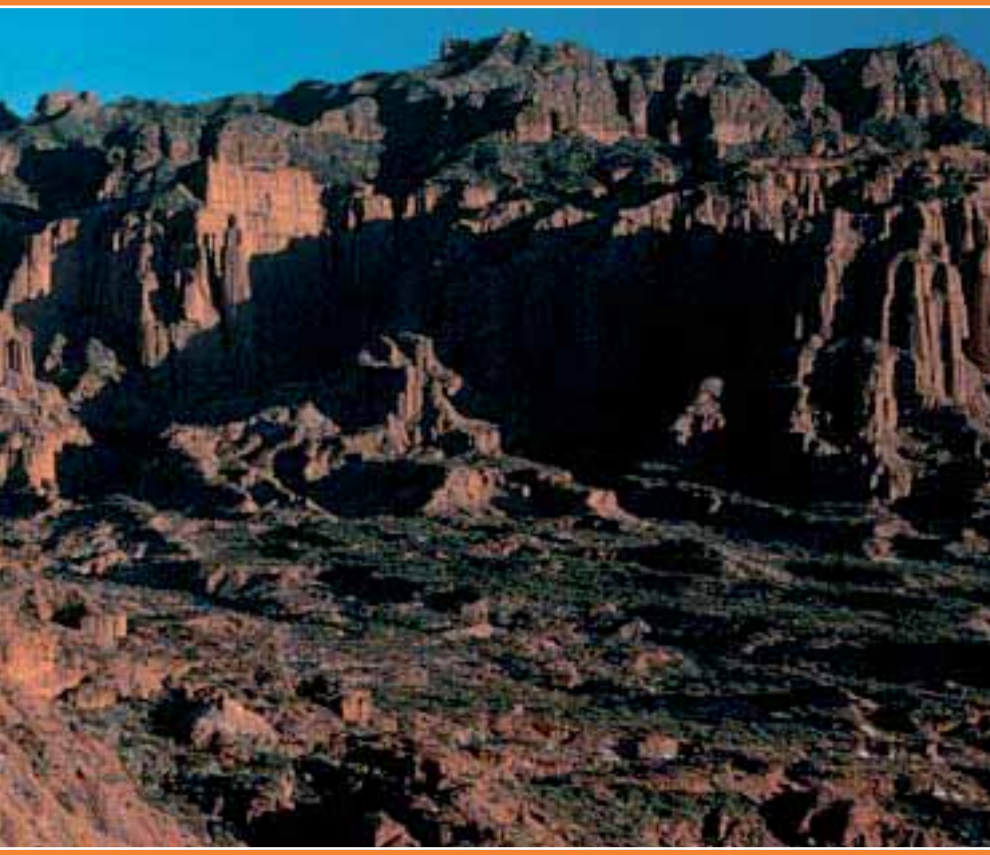
In 1947 he took over the running of the family estates and imposed a careful management plan, reducing the load of animals on the resources to sustainable levels, limiting the area dedicated to agriculture, avoiding any deforestation and prohibiting hunting. This package of measures allowed the habitats to regain much of the former splendour which was theirs till the second half of the XVIIIth century, when the first agriculturalists and drovers arrived in Mburucuya. Even the yatay palms came back, those wonderful palms that had enchanted the French naturalist Alcides D'Orbigny in 1827 when he passed by.

Troels did not stop there. It was his habit to obtain any strip of land that had botanical interest and methodically survey the local plants, sometimes accompanied by such notables as Angel Cabrera and Arturo Burkart with whom he maintained a fluid correspondence. His efforts not only saved hectares of woods and natural grazing. He also contributed to science with the discoveries of new species, some from his own property, and an herbarium of over 30,000 specimens, as well as his collections that grace the Darwinion Institute, the University of La Plata and other important centres of learning both here and abroad. It was no accident that the National University of the North-East and the University of Copenhagen should honour him with Doctorates. Nor that the King of Denmark should name him Knight. His donation of the estancias Santa Maria and Santa Teresa were but the culmination of a life dedicated to the nature of his beloved Corrientes.



La Rioja
San Juan
Córdoba
San Luis
Mendoza
Buenos Aires

Centre



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Otamendi
Natural Reserve

It is likely that the first Europeans to arrive at these shores were met by a landscape similar to the one that dominates this reserve. It is almost the last sample of the original countryside left in the region that has been constantly modified since the first founding of Buenos Aires. The lands were a donation by Dr Romulo Otamendi who had them awarded to him in recognition of his services in planning the railways.

From the Panamerican Rt 9 the land descends in steps to the Parana de las Palmas river. The upper level is of rolling Pampas that come to an abrupt drop on a steep 20 metre, former river bank. There follows a wide flood-plain that is separated from the river by a levée such as is found on the islands of the delta. This varying topography gives rise to three distinct habitats: the grasslands, the *Celtis* woods on the steep well-drained bank and the exuberant gallery forest on the riverside proper. Any walk through the reserve means close contact with nature where the vegetation and birds are the main actors.

On the levée coral-trees with their abundant scarlet blooms abound, together with native willows and the canelon (*Myrsine laetevirens -Myrcinaceae*). Bird-watchers here will encounter the solitary cacique with its hanging nests knitted with black fibre, the rufous-capped antshrike and the dusky-legged guan. In the flood-plain there grow patches of reeds, sedges and pampas grass, habitat for the many-cloured marsh-tyrant, the scarlet-headed blackbird, the wren-like rushbird and the plumbeous rail; and capybaras or he elusive marsh deer.

On the former bank of the Parana river the *Celtis* woods are the habitat of the masked gnatcatcher, the narrow-billed woodcreeper and the nocturnal white-bellied opossum. Above the bank there is a small sample of the rolling Pampas dominated by grasses and low bushes. It

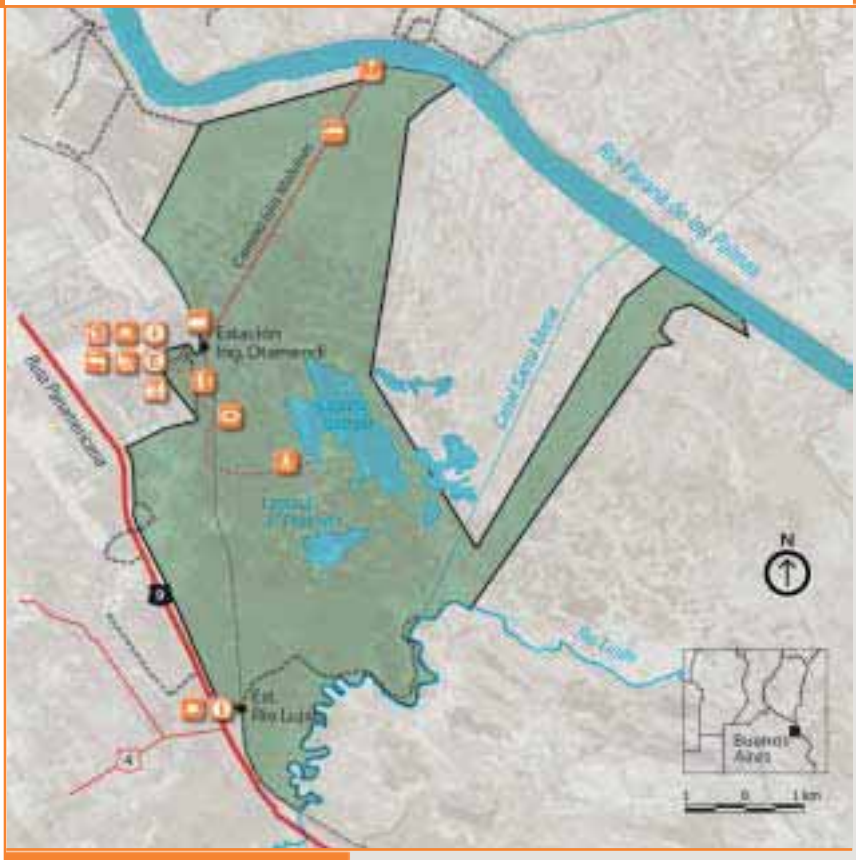
Pampas lake. *Top left corner:* Hummingbird at Coral-tree flower. *Top:* Rufous Hornero.

is there it is, especially in spring, that the grassland yellow-finch put on its flutter-flight display while continually singing.

The area is rich in the pre-Hispanic remains of hunter-gathering people who depended on resources from the water for food. As well as ceramic remains, the archaeological sites have yielded harpoons and bone points associated with the remains fish and "nutria". Dating these has indicated that they are at least one and a half thousand years old. There are also remnants of the late colonial period, perhaps of the the descendants of Juan de Melo who owned the land.

The reserve is pressured on all sides by increasing and unplanned development.

Otamendi
Natural Reserve



Recreational Activities

Treking

Most visitors to the reserve enjoy doing the trails and having contact with nature. Starting at the Visitors' Centre where there is an exhibition of the habitats and natural aspects, then a one kilometre walk on the upper Pampas on an interpretive circular trail with wayside panels explaining the characteristics of the Pampas and the *Celtis* woods. There are excellent panoramic views - one at the end over the flood-plain. A five kilometre trail along Islas Malvinas road heads for the river from the Otamendi railway station. Another 3 km trail starting from the visitor's centre and elevated in the lower-lying parts leads to the lake in the flood-plain. The native tree nursery merits a visit. Here part of the objective is to restore native trees to degraded parts of the park or offer saplings for sale as ornamentals for town streets' shade or for gardens.

Useful Data

Otamendi Natural Reserve

The reserve came into existence as a Strict Nature Reserve by presidential decree 2149 on 10th October 1990; in 1994, by decree 453, it was zoned into three categories - strict reserve, wilderness reserve and educational reserve. The eco-regions represented are the Delta and Parana Islands and the Pampas grasslands. It protects an area of 2600 hectares. The lands occupied by the reserve were donated to the Nation at the beginning of the XXth century by Ingº Romulo Otamendi; the reserve, the railway station and neighbouring village all bear his name. Of interest are the Talar (*Celtis woods*) Trail, the Islas Malvinas road to the river, the visitors' Centre the trailover the flood-plain to the lake and the nursery garden for native trees.

One reaches the reserve from Buenos Aires along Rt 9 (Panamerican highway) to the village of Otamendi between Escobar and Campana (Km 68); two Km down the main street is the entrance. There is a train service from Retiro terminal (Mitre line to Otamendi station, changing trains at Villa Ballester). From Campana there is a regular bus service. The reserve is open from 8am to 6pm (winter) or to 7pm in summer; no entrance fee is charged. For food, lodging or fuel Campana, just 7 Km north has all services and there are service stations and places to eat all along the highway. Otamendi village itself has a place to eat and grocer's stores, while camping facilities and a restaurant are available at Rio Lujan, 5 Km south.

The climate is temperate and humid with an average of 23.4ºC in the warmest month (January) and 10ºC in the coldest (July). Some 1000 mm is the annual rainfall, evenly spread throughout the year though summer storms are more concentrated. Frosts can occur between May and November. Winds affetc the levels in the water-courses, increasing markedly with southeasters.

The best time to visit is spring but insect repellent is recommended aginst mosquitos. In winter everything is more drab but there are no bugs.

Nearby attractions include a Delta excursion in a car or on bicycle, from Otamendi station to Carabelas Grande river, crossing the Parana de las Pamas on a ferry to camp in the Blondeau or Cielo campgrounds. The Zarate-Brazo Largo complex starting from between Campana and Zarate; in Campana you can see the first car made in Argentina, exhibited in the Automobile Museum.

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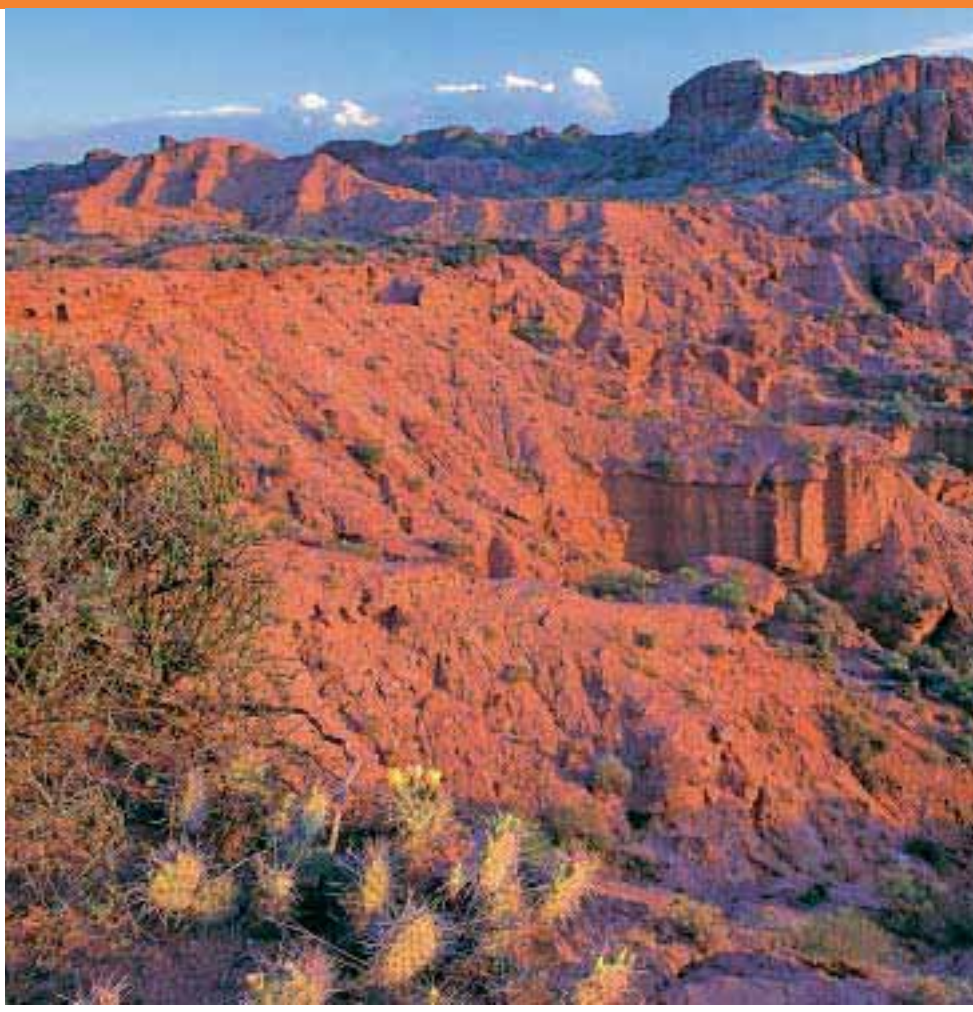
Buenos Aires environment

The growth of a megacity such as Buenos Aires and its suburbs and surrounding towns has completely wiped out natural areas. For this very reason the existence of this reserve is important, only 68 Km from the Buenos Aires Obelisk. It is a powerful educational resource at the same time as protecting natural systems and endangered species such as the marsh deer or the long-tailed otter. It is ideal for bird-watching as the mix of habitats - grassland, woods, flood-plain and river - are home to an interesting variety and the trails take one to them.

Sierra de las Quijadas
National Park



Only one permanent element runs year round in the dust and fever-heat of NW San Luis province, and that is time. Other imperturbable factors have over time sculpted mazes, undercut flaming cliffs and produced impossible shapes in the very heart of a range of hills. From far nothing even hints at the geological whims. Spread over red clay flats of creosote bush, Sierra de las Quijadas hardly stands out from other small isolated ranges of hills. One must reach its heart for one's eyes to behold the fantastic landscape of Potrero de la Aguada.

Surrounded by a wall of cliffs, banks and graded slopes some three hundred metres high, red in colour and sparsely vegetated, the majestic amphitheatre spreads its branching fan of dry stream-beds, etched in white from salts. The skimpy and irregular contributions from occasional showers of rain drain towards the Desaguadero river which until recently petered out in the

Left: Potrero de la Aguada. *Top left:* Cactus in flower. *Top right:* Puma.

Guanacache lake, then so attractive to flamingos. Further west, like misty brush-strokes in the sky, the Andes mountains block the horizon. And in the clear blue sky condors draw lazy circles.

The hills emerged in the Tertiary period, some 25 million years ago, a hump resulting from the uplifting of the Andes. That shrug of the earth's crust also cut off the damp Pacific airs and henceforth desert reigned where before there had been shallow lakes and marshes, home to *Pterodaustros*, a reptilian equivalent of the flamingos (see pp 134-135). Later erosion gave rise to a Martian landscape where only a few cactuses, bromelias, and other leafless plants including the Chica (a living fossil threatened by its use as fire-wood), dared show their face.

Potrero de la Aguada is not the only attraction of the park. There are samples of two eco-regions which are poorly represented in the system of national parks – the Dry Chaco and the Lowland Plains Monte. The first with its mesquite and quebracho trees at the foot of the hills is where the brown brocket and the collared peccari live, giving the area a flavour of the tropics, while the Monte adds its brushland with giant Patagonian cavies, grey foxes and the elegant-crested tinamou. Within the park are found the fairy armadillo, that smallest and least known of the family, five endemic plants – two exclusively found growing within the park - the last guanacos living in the province and the much persecuted puma, as also species threatened by the pet trade, such as the local tortoise, the yellow cardinal; or others by trade in their products: the greater rhea, the boa constrictor.

Paleontologists and archaeologists are also fascinated by the area. A varied procession of dinosaurs left tracks across the park. Every now and then the clay sedimentary rocks of the Lagarcito formation yield up the remains of a *Pterodaustro* that flew around some hundred million

Sierra de las Quijadas
National Park

yeras ago. At Hualtaran are found the "ovens" of the Huarpes where they cooked their food and baked their clay pots. The Guanacache lakes were home to these indians who were "as slender as wands". There they worshipped Hunuc Huar, a powerful spirit of the mountain, gathered mesquite beans, hunted "water-ducks", fished from rafts of reeds, cultivated maize on the edges fertilized by flooding, and, according to an astonished chronicler, wove reed baskets that were "so tightly knit that they could be filled with water and not leak a drop".

Their features, in spite of european interbreeding, endure to this day in the locals, mostly small livestock farmers, who with the creation of he national park found that the same skimpy land that barely supported their animals and led to the emigration of their sons and daughters, was attracting visitors in ever-growing numbers – 30,000 in each of the last three years. This raised their hopes for a better standard of living. As a result the National Parks Administration is promoting the participation of neighbouring communities as much in management as in sharing profits. Further, local tour guides are being trained and there is a new impetus to the trade in handicrafts produced by the Huarpes and others of Spanish descent in the vicinity. A fairer sharing of means is achieved each time someone pays an entrance fee to the park, a camping permit, employs a guide or acquires some handicraft. Is there any better way to celebrate the red desert and its peculiar resources?

Useful Data

Sierra de las Quijadas National Park

The park was created on 10th December 1991 under National Law Nº 24,015 and contains samples of the Dry Chaco and the Plains or Lowland Monte over an area of 73,533 hectares. The origin of the name is traditionally attributed to its once having been the hide-away of highwaymen; the men of the law never could find these outlaws but often came across the remains of their generous feasts where the jaw-bones (quijadas) of cattle abounded. This in turn led to the fugitives being known as the "gauchos de las quijadas", little suspecting that the word would survive through to become the name of the maze where they hid.

Places of interest include the Potrero de la Aguada overlook, 7 Km from the entrance to the park, the little Hualtaran "ovens" of the Huarpes by the entrance road, the trail to the Farallones (cliffs) 3.5 hours hike; the local flora self-guided trail - 45 minutes; trail to the dinosaur tracks - 1.5 hour hike.
To get there from San Luis city, take Rt 147 northwards for 116 Km to reach Hualtaran, the entrance of the park. San Luis has bus services from all over the country, and daily flights from Buenos Aires, weekly from Cordoba and Mendoza. There are cars and pick-ups for rent, chauffeur-driven cars for hire, contact a local tour agent or ride the daily bus which runs from San Luis to San Juan and stops in Hualtaran.

There is an entrance fee, a percentage of which goes towards local initiatives.

There is a campground with basic necessities in the park, as also a provision stores and fire sites and picnic tables, all administered by a local support committee. 7 Km south of Hualtaran, at San Antonio, there is a roadside eating-house Lodging, restaurants and service stations are to be sought in San Luis to the south, or Quines further north. Visitors are recommended to carry abundant drinking water as it is the most scarce resource in the region.

The climate is dry, with marked daily and seasonal variation in temperature. The mean in winter is 12ºC (average minimum 3º), 23º in summer (mean maximum 31ºC). Less than 150 mm of precipitation falls annually and irregularly though there is a wetter season in the hotter months between October and March, and a prolonged dry in winter. Yearround is good for visiting the park though in summer it may be best to enquire as to the state of the entrance road. Plan to be active during the cooler parts of the day. Nearby attractions include the city of San Luis (116Km S) with its two city parks, a handful of museums, and an imposing cathedral. For fishermen and those interested in water sports there is Potrero de los Funes, 130 Km along Rts 147, 20, and 18; Merlo has become famous for its pleasant climate, surrounding hills and tourist facilities (210 Km along Rts 147, 20, 23 and 5).

For further information contact the park's HQ at:
Parque Nacional Sierra de las Quijadas
Casilla Correo 147, 5700 SAN LUIS,
Tel. and fax (02652) 490182,
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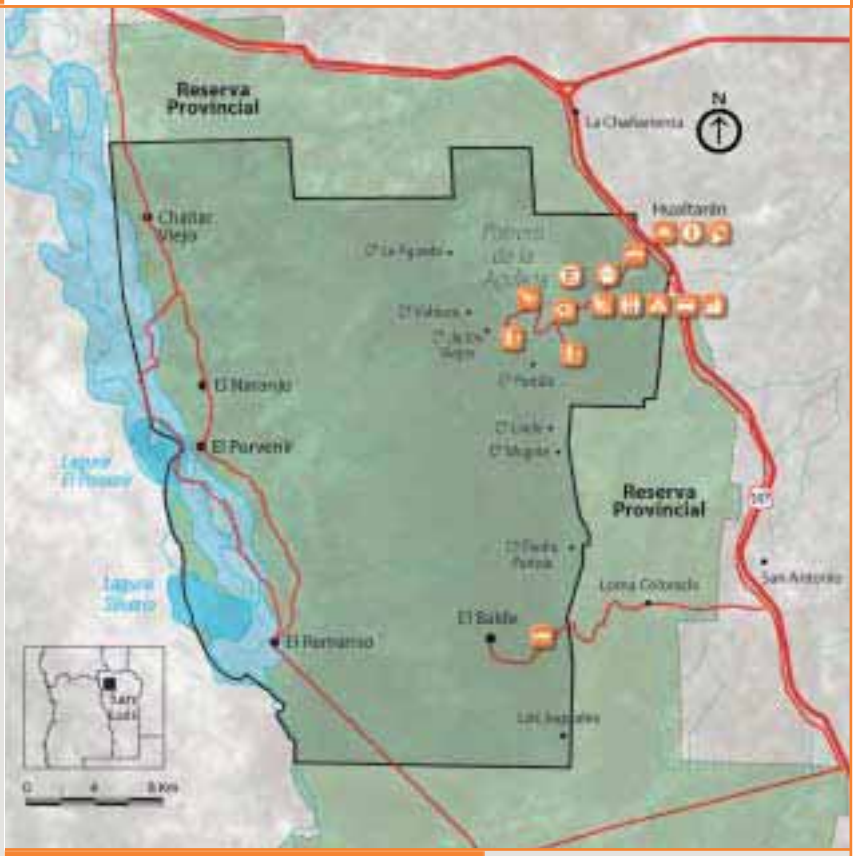


Recreational Activities

Hiking

Once upon a time Quijadas was the hideaway for outlaws; it is said that even Santos Guayama and Bairoletto sought safety here. Today it is a box of surprises. On the entrance road one comes across the first of these: just metres from Hualtaran appears one of the greatest concentration of "little ovens" in Argentina. It seems that the Huarpes produced pottery on a massive scale. A little further along the road the Native Flora Trail explains 22 species of the local plants (less than an hour to walk it, self-guided and easy going). After 7 Km the overlook is reached and offers one of the magnificent views in the country, the Potrero de la Aguada.

From this balcony three trails start: one is along the rim of the great depression and at sunset offers magnificent views - one hour of easy going; another descends to a white quebrcho copse where millions of years ago a great dinosaur left tracks in the mud (2.5 hours, medium difficulty, only with a guide); The third descends and follows a dry river-bed to fantastic cliffs, taking in the wierd El Jume erosive red sandstone formations on the way - 4 to 5 hours of medium difficulty, a guide is mandatory.

Whichever trail is chosen remember to take an ample provision of drinking water. In Potrero de la Aguada thirst and beauty run hand in hand.

Species of Value

Lesser Fairy Armadillo
(Chlamyphorus truncatus)

The smallest of all armadillos is barely six inches long, protected by a cardboard thin shell under which there is a coat of silky white hair - quite unmistakable. It lives underground in "bubbles" or pockets of air, dug with its immense claws and compacted behind with the hard end-shell. It appears that it feeds on worms, larvae, seed, ants... Exclusively Argentine, it is considered threatened.

The desert of the "Huarpes of the swamp"

Two lines of the Huarpe people shared the Cuyo region of San Juan and Mendoza in times before the Spanish conquest - north and west lived the *Allentiac*, potters and agriculturalists, while in the south were the *Milcayac* who based their economy on hunting and gathering. To the first group belonged the people who made the "little ovens" at Hualtaran, but there was a group that are referred to as the "*Huarpes laguneros*" or Huarpes of the swamps (or Guanacache) who on the immense shallow lake of bygone years were wont to fish from rafts of reeds somewhat like those still in use on lake Titicaca.

The arrival of the Spaniards was traumatic for the Huarpes. The system of taking the indigenous people for work on the land (*encomiendas*) disarticulated the communities and obliged the Huarpes to work in Santiago (Chile) and in Mendoza. Interbreeding diluted their culture. The Guanacahe wetlands fared no better. From providing varied natural resources the area was turned into one of extensive grazing of livestock and erosion set in for a number of causes. The arrival of the railway towards the end of the XIXth century helped lay waste to the woods of *Algarrobo* (mesquite-like trees), and starting in the XXth century, agriculture took the water for irrigation from the San Juan and Mendoza rivers, drying up the wetlands together with climatic and geological factors - and the desert set in.

Poverty came by the hand with aridity. Between sand dunes and dry river beds some 2000 Huarpes of the swamps barely eke out a living from breeding goats, selling the manure, firewood and *junquillo* for making brooms, harvesting the mesquite beans and some handicrafts. But they do not give up. In true Huarpe tradition they fight for the recognition of their communal rights to that punished land. They struggle for the implementation of a recuperation programme approved in 1999 by the governments of San Juan and Mendoza. This has placed the Guanacache lakes under the RAMSAR convention of wetlands of international importance. And when they need rain they take out an image of St. Vincent, light a candle to him - not more than one as that could bring flooding- and while it is burning dance *cuecas* around the "rain saint" as in bygone years their ancestors did in honour of Hunuc Huar.

Peregrine Falcon
(Falco peregrinus)

This bird is considered the fastest being on earth; German scientists have measured - and the Guiness Book of Records publishes - speeds of between 270 and 350 Kph in diving on its prey. In Sierras de las Quijadas it uses ledges on high cliffs both for nesting and as look-outs for finding the pigeons, seed-snipe and other birds on which it feeds. To see this bird in attack is one of the most thrilling spectacles of the park. It is also seen boldly harassing other and larger birds of prey if they come too near its nest. Eagles and even the condor lose feathers to the defending falcons.

Giant Patagonian Cavy
(Dolichotis patagonum)

This Patagonian "hare" as it is also but erroneously known, is the largest of our endemic mammals, 70cm long and weighing some 15 kilos. It feeds on foliage, shoots, bark and roots and mates "for life". Two young are pupped per litter, and these are deposited in traditional communal burrows which both adults and young prepare and adapt. Diurnal, they frequent open spaces and are always alert for pumas or Geoffroy's cat. In fleeing it can cover short distances at fifty miles an hour. When cornered it urinates at its aggressor in squirts which can reach three metres distance.

Chica
(Ramorinoa girolae)

This bus (or is it a smallish tree?) only grows on the slopes of hills in the Monte; extreme conditions of aridity do not hinder it as its extended system of roots procures the humidity necessary for its survival. Its total lack of foliage prevents the loss of the precious liquid through transpiration. Photosynthesis is carried out in the green bark of sharp-pointed branches and twigs that are its protection. Thus it has been able to survive from the times of the dinosaurs. Today, however, it is amongst the threatened species of plants for several reasons: over-exploitation for firewood, its limited distribution and its extremely slow growth-rate. The loss of this living fossil that is exclusively found in our country would be unforgivable. The wood has an attractive grain which the artesans in the region find irresistible. The seed has a pleasant flavour and the locals toast it as a subsitute coffee. And in spring it is covered in yellow flowers and gives the wastes where it lives a touch of brightness.

SIERRA DE LAS QUIJADAS

CRETACEOUS PARK

Apart from the whimsical forms it leaves us, erosion has uncovered the tracks and fossilized bones of creatures that are of great interest to science. The most notable is *Pterodaustro guiñazu*, a strange flying reptile shaped something like a flamingo; the region is famous to paleontologists the world over because of this species.

A Lagarcito Formation

No inhabitants

Age

100 million years

Cretaceous Period at the Mesozoic Era

In the region there was a chain of interconnected lakes. A large variety of animals were located there.

Many of the fossils belong to a flying reptile

Other associated fossils

- Fishes
- Amphibians
- Crustaceans
- Flowering plants

Pterodaustro guiñazu

It is believed that it lived in a large colonies and that it was somewhat like a flamingo

The first specimen was discovered in 1970 by Dr. José Bonaparte

Size

Adults:
2,5 m wingspan

Juveniles:
30 cm wingspan

Its enormous eyelashes, acquired and extremely long, served as the base for development of a wing.

Fossil of *Pterodaustro guiñazu* found in Lagarcito

Time Line

Era	Triassic	Jurassic
Millions of years ago	248 243 238 231 225 219 213 206 200 194 188 181 175 169 163	

Sierra de las Quijadas Formation

1 Formation of the watershed

120 million years ago in this location

a sedimentary inland watershed existed (without maritime influence)

2 Siltation

During the following 20 million years the watershed filled with sediments from erosion of the mountains.

3 Folding

25 million years ago (Tertiary Period), displacement of the tectonic plates of South America raised the area and Sierra de las Quijadas was formed.

And it is still rising.

4 Erosion

Since then, water and wind erosion have carved valleys and canyons. As a result the sediments that were deposited over 100 million years ago are being exposed at the surface.

B El Jume Formation

Open to the public

Age

120 to 110 million years

(Cretaceous Period of the Mesozoic Era)

This is the oldest formation

In the red cliffs of the valley called Potrero de la Aguada, tracks of three main groups have been discovered:

- **Ornithopods** ("duck-billed dinosaurs"). Bipedal or quadrupedal, herbivorous, some sporting humps on the back.
- **Sauropods**. Quadrupeds, herbivorous and often uncommonly large, with extremely long tails.
- **Teropods**. Bipedal, predators with specially adapted teeth.

Bibliography: Rivarola, D. 1997. El Parque Nacional Sierra de las Quijadas y sus recursos naturales. D. Rivarola Editor.

El Leoncito
National Park

On the western slopes of the Sierra del Tontal, in the SW of the province of San Juan, is Argentina's main window into space, The Leoncito Astronomical Centre, CASLEO Observatory. The telescope is the fourth in size in the southern hemisphere, two metres in diamenter and weighing four tons. Some 80 scientists, both Argentines and from abroad, use it each year to pry boldly into the depths of our galaxy. Only a few kilometres away, the Dr. Carlos U. Cesco Astronomical Station built by Yale University (USA) and administered by San Juan University, follows the courses of the stars.

This double initiative is no accident – El Leoncito has almost ideal conditions for astronomical observation: one of the clearest skies in the world, 300 nights free of cloud each year, little wind and low humidity. Further, there are two cities in support only a few hours' drive away – San Juan and Mendoza. And it is 2,552 metres closer to the stars than anything at sea-level.

Guaranteeing the perpetuity of these ideal conditions for astronomy has been one of the worries of the National Science and Technology Secretariat that

Ciénaga de las Cabeceras. *Top left corner:* Cactus in flower. *Top left:* Cavy. *Top right:* El Leoncito Astronomical Centre.

owns CASLEO. The purchase of an enormous tract of surrounding desert to keep undesirable neighbours such as cities, industries and wineries away was not enough, the Province passed an unusual law in 1989 for the "protection of the sky"; Barreal, the neighbouring community, is required to have non-contaminating lighting. Not even vehicles are free from regulation – near the observatories they are required to switch off their head-lights.

But all this was still not enough. Livestock grazed the area with consequent atmospheric dust flying, so it was necessary to protect the land as well as the sky, and on this subject the astronomers knew nothing. So it was not surprising that they welcomed the idea of entrusting their 73,000 hectares to the National Parks Administration. In January 1994 the Leoncito Strict Nature Reserve was born which in 2002 became the 27th national park in Argentina and the first to have the specific objective of protecting the sky.

The priority action was to

El Leoncito
National Park

revert erosive processes. Livestock were excluded by fencing the old passes and thus keep them out. And the activities of off-road motor-cycles was reduced by 90% by an intensive environmental awareness campaign. These last had had a strong environmental impact. Now the native vegetation is recuperating and the sky can breathe anew.

The contribution of El Leoncito to the system of national parks is not a minor one as it added samples of three ecosystems that were poorly represented in protected areas: the Northern Monte, Puna and High Andes. There are two endemic plants that botanists named *Mulinum etchegarayi* and *Trichocline cinerea*. Another that is in danger of extinction is the local "broom". Amongst birds it is the puna rhea that is the endangered species represented in the park. There are also good numbers of guanacos, condors, pumas, seed-snipe, red foxes, sierra-finches, mountain viz-cachas, cavies and tuco-tucos – a gopher-like underground rodent.
Between the creosote bush scrub at 1600 metres above sea-level and the bunchgrasses on the Tontal skyline (at 4300m) there are three paleontological sites, petroglyphs with mask-type figures, a stretch of the Inca Trail and the old homestead of the Leoncito estancia where General San Martín completed details for his famous crossing of the Andes. However, it is not on the ground that the chief attraction lies, but in the heavens toward which the CASLEO telescope points every night.

Useful Data

El Leoncito National Park

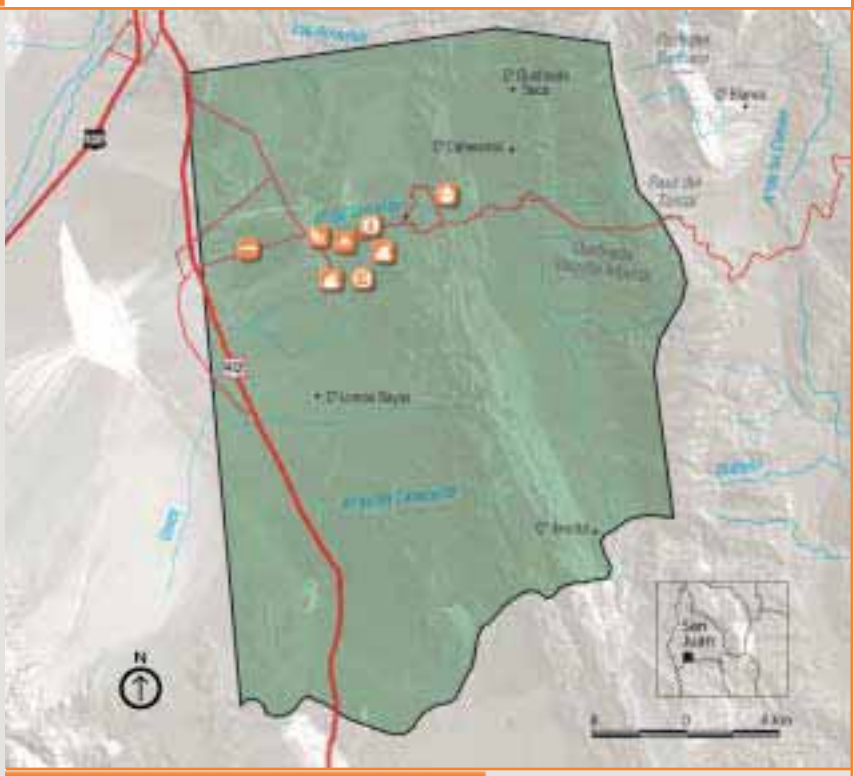
Leoncito first became a Strict Nature Reserve in 1994 and was promoted to a national park on 15th October, 2002. It contains representations of the Northern Monte, the Puna and the High Andes over a surface area of 72,962 hectares. The name is taken from the estancia which in turn was named after an abundant native plant called Leoncito - *Maihueniopsis glomerata*. This estancia was ceded by royal favour to Diego Lucero de Tobar in the XVIIth century. The southern portion was acquired by the Federal Government to install the observatories there.

Points of interest are the CASLEO observatory, the Dr. Carlos U. Cesco astronomical station, the homestead of the old Leoncito estancia and the Cienaga de las Cabeceras.
The way to get there is, from San Juan take Rt 40 as far as Talacasto, Rts 436 and 12 to Calingasta, and onwards along 412 to the park entrance (a total of 244 Km). (For a period the building of the Punta Negra and Los Caracoles dams will affect Rt 12 to Calingasta). From Mendoza take Rt 7 to Uspallata, then 39 to the park entrance, a total of 230 Km. Both San Juan and Mendoza are served by bus lines from all over the country and daily flights from Buenos Aires and Cordoba. There are cars and pick-ups for rent in these cities, cars with drivers (remises), or turn to tour agencies that handle excursions. There is a daily bus service from San Juan to Barreal (the nearest town some 34 Km northwest) and from there a "remis" or other vehicle offered by the various hostelries. No entrance fee is charged. Lodging, food and fuel are not available in the park. There there is only a picnic area with fire sites. However, they are all available in Barreal - all manner of hotels, inns, cabins for rent, campgrounds, supermarkets and service stations.

The climate is dry and cold at height, but in the lower portions dry and warm - average 26ºC in summer (maximum 35), 10º in winter (minimum - 6º); a great daily thermal range is characteristic as is the luminosity (strong sun). Rainfall is below 200 and falls mostly in summer. Winter snow is exceptional at the lower elevations.

The park can be visited at any time of year though the spring with its flowering "broom" is very attractive. Summer rains may cut the roads briefly.
Nearby attractions include the Pampa del Leoncito to the west, one of the best places in the world for sailing cars on dry mud-flats (or salt). On the other side of the Calingasta valley, 25 kilometres from Barreal, are the high Andes and the famous rock paintings on Los Morrillos Private Wildlife Refuge. Southward Rt 412 (changing to 39 in Mendoza province) leads to the Uspallata valley, while northwards it connects enchanting places such as Cerros Pintados and El Alcazar (this being the master-work of erosion) and Calingasta where the Jesuit chapel dates from the XVIIIth century.

Further information is to be had from
Parque Nacional El Leoncito
Belgrano s/n
5405 - BARREAL, Provincia de San Juan
Tel (02648) 441240, Fax (02648) 441155,
e-mail: elleoncito@apn.gov.ar.



Recreational Activities

Astronomical observation

The Cascade trail (1200 m long) starts by the old estancia's homestead and allows for a closer look at the native Monte vegetation with all its heroic adaptations to the desert conditions. At the Cienaga de las Cabeceras, at the end of the access road near the CASLEO observatory, one can see Puna rheas, cavies, an interesting variety of birds and the occasional fox. However, the chief attraction in the park are the astronomical observatories.

CASLEO welcomes visitors between 10 am and noon and from 3 to 6pm. These are led by a technician and take 45 minutes to view the centre's installations, explaining the characteristics of the equipment. - especially the Jorge Sahade telescope - and the work done there. It is possible to spy on the night sky through a smaller telescope, and with the assistance of a technician (not more than 8 persons at a time) with food and lodging included). For reservations and information call or fax CASLEO's Secretariat at (0264) 4213693.

It is also possible to visit the Carlos U. Cesco astronomical laboratory which is reached by an side road off the main entrance road. Its Visitors' Centre is open daily from 10am to noon and from 4 to 6pm (during school holidays from 10am to 6pm). At night it offers the possibility of watching stars through their astrographical telescope. To arrange for a visit or for more information e-mail centrohugomira@yahoo.com.ar.

Species of Values

The Local Broom
(Bulnesia retama)

We have not been fair to this useful member of the Zygophilaceae family. Its wood is hard and heavy, with a lovely grain; it makes excellent charcoal and is used in lathe work and for the handles of tools, chess pieces and ash-trays. The wax that covers young branches is used for polishing shoes and floors. The bark yield a greenish yellow dye. In traditional medecine the tender shoots are boiled for an infusion that activates blood circulation and strengthens week legs. In spring its copious blooming enlivens the drabness and aridity of the Cuyo wastes. For these reasons and without the slightest concern, it has been over-exploited, especially as a source for posts in the vinyards. Today in spite of its former abundance, it is considered vulnerable. Within the park it grows at the lower elevations.

The Puna Rhea
(Pterocnemia pennata tarapacensi)

This northern race of the lesser rhea is browner than its grey Patagonian form, but differs from the greater rhea in being much smaller (1.1m as against 1.8), but in other respects it is similar enough to be considered a pocket version of the greater. It is a great runner and well adapted to the harsh conditions imposed by elevation. Its food consists of anything it has within reach – shoots, seeds, flowers, fruit, insects, lizards and even small rodents. It wanders around the high steppes in smallish flocks of upto 15 birds and is an enthusiastic polygamist for which males pay a high price. Their reproductive responsibility only begins with copulation. Thereafter males build the nest – a scrape -, incubate the eggs for over 40 days, and rear the chicks for most of the succeding year while the females are off with the next male in the pecking-order.

The Mountain Vizcacha
(Lagidium viscacia)

This animal looks like a cross between the plains vizcacha and the high mountain chinchillas. It lives in colonies in tumbled rock at the bottom of steep slopes between 2000 and 4000 metres above sea-level and feeds on shoots and leaves of the hard grasses that grow in its habitat. It only produces one offspring per year (rarely two) and takes long sunbaths during the more benign hours of the day. With its thick and silky pelt it is

defended against the rigours of the limate, but has been saved from becoming a furrier's product by its year-round moulting. Thanks to this it is not in any danger as is the case of the chinchilla in the wild. Its capacity to climb impossible slopes, the tail-shedding when caught by that appendage and its whistled alarm call, all of great effect against the puma and the red fox, would have availed it nothing against man.

An historic estancia

The national park is on lands that once belonged to Estancia El Leoncito which had its origin in a grant by royal favour to Don Diego Lucero de Tobar in the XVIIth century. The farm's history was not limited to the production of livestock and seed crops. Between 1814 and 1818 the homestead was an advance post for the Andes Army which, tradition will have it, was here organized in its final details by San Martin for his campaign of liberation from Spanish rule. The "shack" also gave refuge to Domingo Faustino Sarmiento on his escape to exile over the mountains in Chile; and not far from the building the loyal San Juan troops faced the rebels of "Chacho" Peñaloza.

Two relics of those times still survive: on the access road to the CASLEO observatory, the centenarian building still stands, while a little further, in the Cienaga de las Cabeceras there are still adobe blocks of the Rancho del Cura, the summer retreat of Father Eleuterio Cano who founded Barreal and was one of the descendants of Lucero de Tobar.

In El Leoncito there are also remains from much more distant pasts. In the remote and off-limits part of the park, far from the visit, there is a rich show of rock art with a marked predominance of "masks" and "masked figures" which recall Inca images. There are still identifiable stretches of the Inka Ñan (Inca Trail) between the Portezuelo del Tontal and the Calingasta valley. Until the XXth century locals used this path for travel between San Juan and Barreal.

MINIGUIDE

VOYAGE TO THE STARS

In El Leoncito the sky is the star. One of the most captivating experiences is simply watching the sky. Here is a brief guide for identifying the main stars and constellations.

The Southern HEMISPHERE SKY

THE INSTITUTION

The El Leoncito Astronomical Complex (CASLEO) was created in May 1983, with the participation of the Science and Technology Secretariat, the National Scientific and Technical Research Council (CONICET) and the National Universities of La Plata, Cordoba and San Juan.

It has been in operation since 1987

The two main telescopes are used by 220 scientists from 12 countries each year.

for 20 persons

It is at 2.552 metres above sea-level

Gemini (the twins)

Orion's Belt
Formed by three stars locally known as the Three Marys in Orion, the hunter. For the Tehuelches the three were the stones that a young hunter threw when trying to catch a dodging rhea.

Orion
Represents a hunter who, according to Greek legend was created by three gods – Zeus, Hermes and Poseidon

Milky Way
According to a Greek legend the Milky Way was formed when Juno, giving breast to Hercules, spilt some drops of milk that later became stars. The Mapuches call it Wenuleufu – River in the Sky.

Unicornio

Canis Major
Includes Sirius, the brightest star in the sky. For the Greeks it was a dog that Zeus made into a constellation to accompany Orion on his hunts.

Flying Fish

Chamaeleon

Centaurus

THE TELESCOPES

1. the "Jorge Sahade" telescope

One of the ten best in the world for its size

Reflector type with a primary mirror of 215 cm diameter and a secondary one of 66 cm.

Weight 40 tons

For spectrometry, photometry and polarimetry

2. "Helen Sawyer Hogg" telescope 60 cm diameter Weight 5 tons

THE SKY

El Leoncito is characterized by the deep darkness of its night sky and its clear atmosphere, with low water vapour content and unpolluted.

The sky is clear for **300 nights out of the year**

STARS AND THE ORIGINAL PEOPLES

Stars play an important role in the beliefs and the cosmovision of our aboriginal people. There are many examples of this. According to the Ava Guaraníes, a pale blue jaguar is responsible for eclipses when it eats the moon and it is necessary to raise a dreadful racket for it to release its prey. The Kom' Lek or Tobas see the Dapitchi (grandparents) in the stars and constellations, who still hunt along the rhea's trail (Milky Way). And the Tehuelches believed that the Southern Cross was the footprint of some mythical rhea.

In the Morrillos Wildlife Reserve west of El Leoncito National Park, there are rock paintings that, according to the acknowledged expert Mariano Gambier, represent an astronomical trilogy with anthropomorphic characteristics that was worshipped by the local tribe. Sun, Venus and Moon near the winter solstice.

MAIN DISCOVERIES

The explosion of the eclipsing binary star Wolf-Rayet HD 5980, in the lesser Magellan Cloud, a galaxy that is close to Earth (160,000 light years). This event was seen in 1994.

Discovery of a new type of radiation (T radiation) during solar explosions.

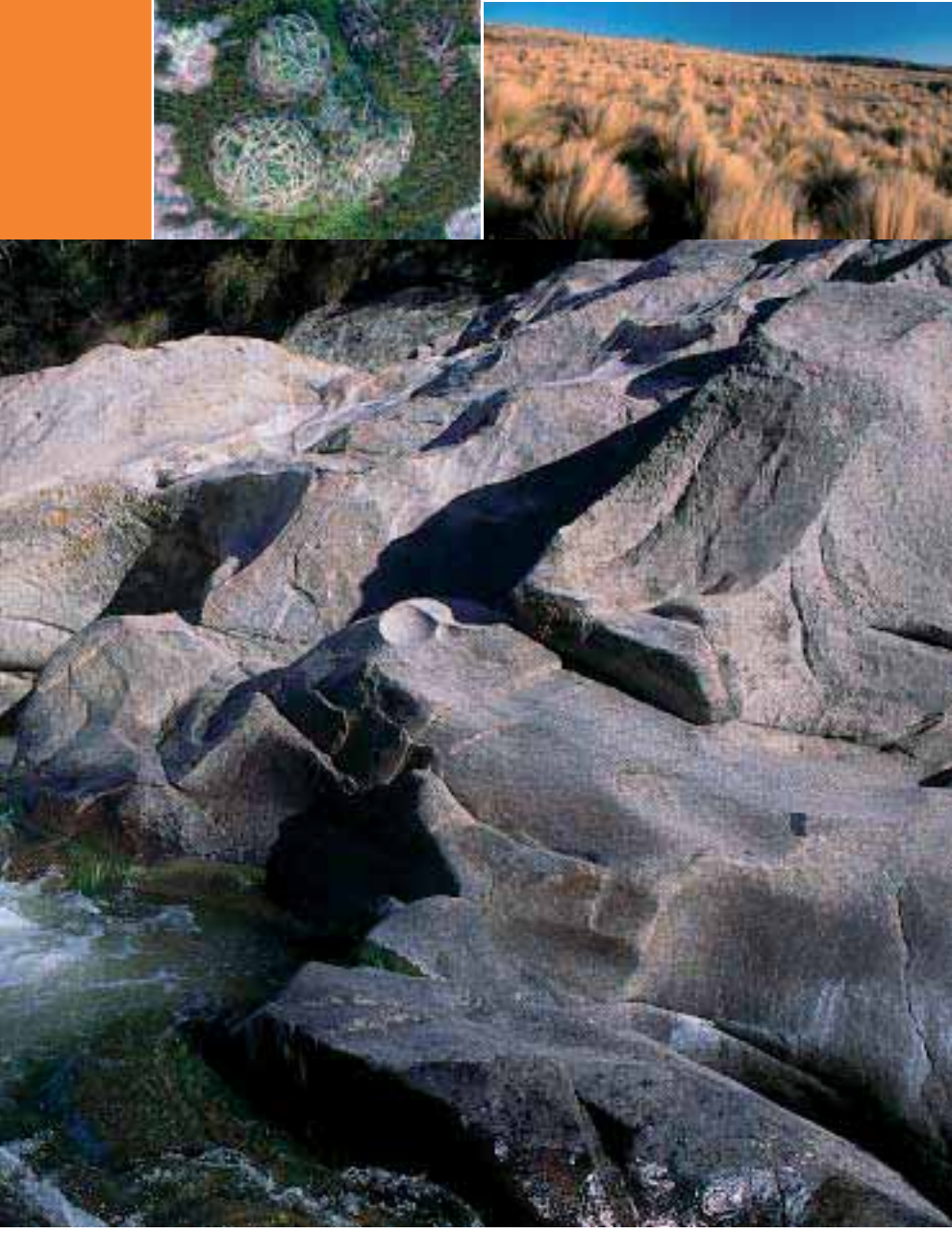
Several dozen multiple stars.

The representation of the sky is for no particular date and is merely for illustration.

Quebrada del Condorito
National Park

In the middle of Cordoba's Sierras Grandes, Quebrada del Condorito National Park offers unique landscapes and habitats, found nowhere else in the country. It is in one of the most visited areas of Argentina; on either side of the mountains a string of towns and villages is home to many residents and the holiday destination of numbers tourists. However, the elevation of between 1900 and 2300 metres above sea-level and the lack of roads into the area kept it isolated until fairly recently. Today the Altas Cumbres road between Villa Carlos Paz and Mina Clavero, allows for easy access to these strangely seductive districts with their mist-softened landscapes and windy wildernesses.

The park covers more than one third of the Pampa de Achala, an upland plain at over 2000 metres, and the imposing gorge-like valleys that descend from it,



amongst which we can name Condorito, del Sur, Corralejo and Yatan. Wrapped around the national park is the Provincial Hydrological Reserve covering the rest of Pampa de Achala and a high proportion of the Sierras Grandes. Two imposing blocks of mountains mark the ends of this system of protected areas – the Gigantes to the north and Champaqui at the southern end, the highest point in the Province of Cordoba at 2790m elevation.

Condorito river, in the bottom of the canyon. *Top left:* Typical cactus. *Top right:* Upland grassland.

The only way permitted to visit the park is on foot, on bicycle or on horse-back; there is a horse-rental operation. This makes it a favourite destination for hill walkers. The name derives from the deepest ravine-valley, del Condorito, 800m deep with steep bare walls. The valley is the domain of condors that nest in inaccessible recesses of

Quebrada del Condorito
National Park

the cliff-face. From the edge, at places called Balcon Sur and Balcon Norte (this last at the end of an interpretive trail with interesting information), one can observe the majestic flight of the condors at eye-level or below. Many of the birds are in juvenile or immature plumage - the south wall is an important breeding site. It is also almost its easternmost point of distribution.

Though the park is classed as being in the Dry Chaco, influences of other biomes are everywhere evident in the animals and the flora. Here is the northern limit of distribution of many Patagonian species, and southeastern of Andean species. Great variation in elevation, coupled with the deep valleys, produce many habitats in the area, each at its own level.

The dominant vegetation are the upland grasslands with copses of the Tabaquillo tree (*Polylepis australis*) and Maiten (*Maitenus boaria*) becoming dense woodlands in the bottoms of protected valleys where ferns and epiphytes abound. As one descends, the grasslands are replaced with scrubby bush, becoming Hill Chaco vegetation at lower elevations, with *Fagara coco* and *Lithraea molleoides*.

Quebrada del Condorito National Park is home to a number of endemic species and races - two amphibians and two reptiles, one of which, a green rock-lizard, is the emblematic species of the park. The local "red" fox is a form exclusively of these mountains as are also several species of birds.

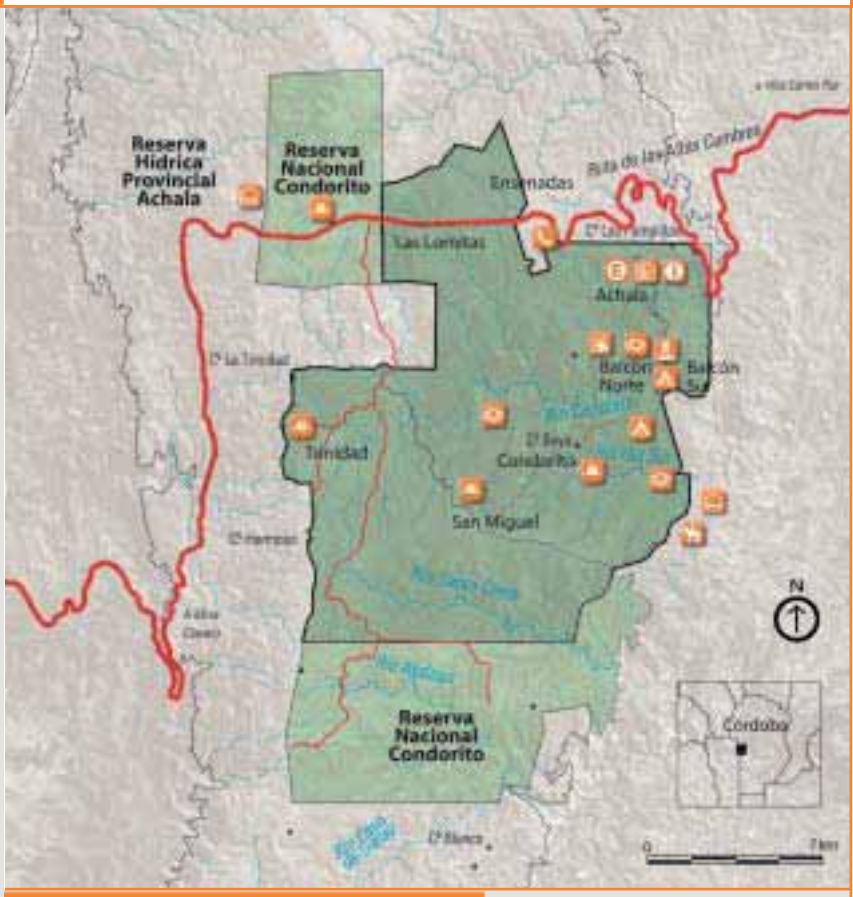
Useful Data

Quebrada Del Condorito National Park

The park was created on 6th January 1997 under National Law Nº 24749. It is classed as being in the Dry Chaco and covers an area of 37,344 hectares. The name comes from that of the deep valley where many condors nest. Points to visit are the north and south balconies overlooking the Condorito Valley. There is an interpretive trail on the north rim. The hiking path in to the park starts from Rt 34 (Altas Cumbres road), that runs between Villa Carlos Paz and MinaClavero, 52 Km from the first, 70 from Mina Clavero. For two kilometres one crosses private land before coming to the park proper. Several bus lines travel the Altas Cumbres road starting from Carlos Paz, Mina Clavero and Cordoba city which receives flights from Buenos Aires. One can also reach the park in a car (rental or chauffeur-driven – remis) or use the services of a travel agent. Entry is exclusively on foot and no entrance fee is charged. For overnighting, there are two places in the NE part of the park where tenting is allowed - Cañada del Hospital and Pampa Pajosa, this last near the North Balcony. The Condorito mountain refuge has room for 15 persons and offers bathrooms with hot and cold water, heating, a kitchen (information from Tel. 03547-488801 / 0351-4231530). Mina Clavero and Carlos Paz have all manner of facilities for tourists and on Rt 34 there are bars, cafés and service stations. It is also possible to stay and eat at local farms.

The cool temperate montane climate has average summer temperatutes of 14.5ºC and 5.5º average in winter with a minimum of –10ºC. Some 800mm is the average yearly precipitation, most in the hotter months, though some snow is fairly common in winter and there are many misty days (62) throughout the year. The best seasons to visit are spring and autumn - cold can be cruel in winter and in summer there are rainstorms. Other points of interest in the vicinity are the Rt 34 itself, the Traslasierra Valley with many villages and bathing places, the source of the Mina Clavero river.

For more information:
Parque Nacional Quebrada del Condorito,
Sabattini 33 - Oficina 2,
(5152) Villa Carlos Paz, Provincia de Córdoba,
Tel/fax (03541) 433371,
Cell phone. (03541) 15621727/26,
e-mail: quebradadelcondorito@apn.gov.ar



Recreational Activities

Trekking

The favourite activity of visitors to the park are treks - long hikes - all marked trails in the park need several hours to walk. Though many prefer to trek on their own, others prefer to contract guides or organized outings for simplification. On the walks one has opportunities of viewing spectacular landscapes and views of the many lakes in the valleys below, on either side of the mountains.

One should wear comfortable footwear, take warm clothes, carry water and food for the day. If coming in a car consider that there is no parking within the park; it is best to leave your vehicle at roadside cafés or the service station some kilometres from the gate. Those who wish to delve deeper into the nature of the area should spend their nights at the Condorito Mountain Refuge, in the very heart of the park, one and a half hours on horseback from the South Balcony. Riding horses is an attractive alternative for exploring the park; there is only one concession (information and reservations by tel. 03547-488801 / 0351-4231530).

Species of Values

Puma
(Puma concolor)

The puma is the most widely distributed cat in the Americas, from Alaska to the southern tip on the straits of Magellan. Wonderfully adaptable, it can live in mountains and plains, from deserts to rainforest. It spends most of the day sleeping and resting in trees, in some rock-shelter or tucked between clumps of tall grass. At dusk it emerges to search for food and has a wide spectrum of tools for hunting - amazingly sharp senses, powerful dagger-like teeth and strong, sharp claws that it sharpens on tree-trunks. It can even hunt monkeys in trees by leaping elegantly from branch to branch like an acrobat, or surprise some inattentive deer with a leap of several metres. It can take animals much larger and faster than itself such as guanacos. Though it is not on our list of threatened species its numbers are being constantly reduced as the wild places it frequents come under cultivation, or through being persecuted by cattle breeders.

Andean Condor
(Vultur gryphus)

The undisputed symbol of the Andes, a spectacular soarer. This species figures widely in Andean mythology. Anyone who has had the opportunity of seeing the bird in flight is amazed. Its distribution is all down the Andes from Venezuela to Tierra del Fuego and Staten Island off the SE tip of the main island of that archipelago.
The wing-span is over ten feet (3 metres) and birds weigh in at 11 or more kilos. Adult birds are black with large white patches on the upper surface of the wing, and a white velvet collar on the neck below a bare reddish head. Juveniles are blackish brown. Males are larger than females and have a fleshy carruncle disk along the top of the bill to the forehead.
In spite of the popular and erroneous belief that they are birds of prey that has led to their persecution, condors are exclusively carrion feeders and as such are an essential part of the system for cleaning up the remains of dead animals; the beak is strong enough to open up the hide of the larger corpses, thus giving access to lesser species of carrion-feeders.
Pairs raise a chick every two or three years, which they feed for several months before it leaves the nest.

The water factory

The cold heights of Pampa de Achala are like a large receptacle for collecting rain-water. Here are the head-waters of the principal rivers of the province that descend through deep canyons on the eastern slope, such as that at Icho Cruz and Condorito, Del Sur and Yatan. These torrents, dammed at San Roque, Rio Tercero, Piedras Moras, Los Molinos, Cruz del Eje, Pichanas and La Viña, provide water for over 60% of the province's population. This is the essential reason for protecting the headwaters on Pampa de Achala. The depth of the soil, its texture and organic content, and the different plant covers (especially the tabaquillo woods) are fundamental in the conserving sources of water in the region. It is for this reason that at the same time that Quebrada del Condorito National Park was created, a Provincial Hydrological Reserve was instituted surrounding the protected area.

Tabaquillo
(Polylepis australis)

This lovely small tree is of the rose family. The woody parts are wrapped in layers of paper-thin of bark, of cinnamon colour, resembling an untidily rolled cigar, which protect the trunk and branches from frost. Locals use these sheets of bark to roll cigarettes in the manner of corn husk. Well adapted to conditions reigning at height, it forms small woods and copses from 1700 metres elevation upwards, though in Bolivia it has been recorded at 5200. It does not grow in the lowlands and is exclusively South American; it is found from Venezuela as far as Argentina, and though here it is typical of the NW, it also grows as far south as Cordoba.
In the Cordoba mountains it plays a vital role in the protection of the headwaters of watersheds. In Quebrada de Condorito National Park it grows profusely but in neighbouring areas such as Los Gigantes it is only found where fire and cattle do not reach. A project to reforest the larger Cordoba hills with this species aims at preventing erosion and re-establishing the high mountain woods.

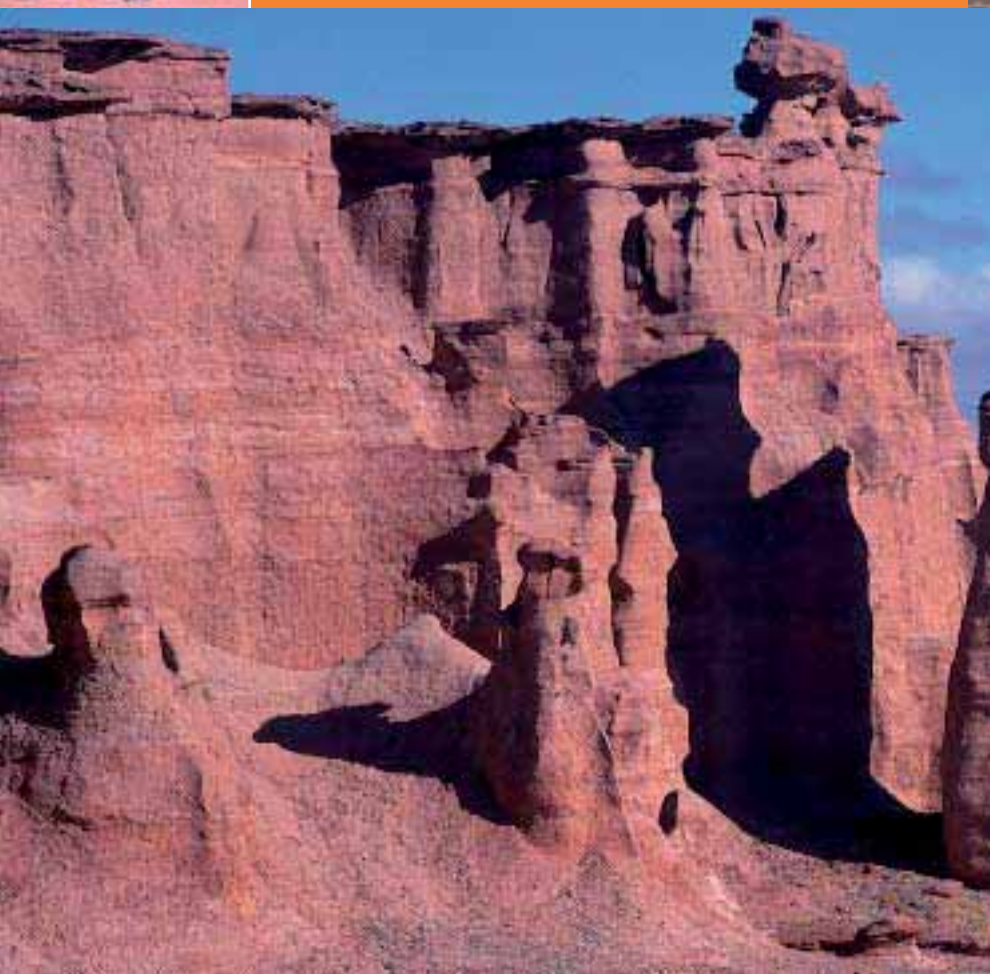
Yesterday and today

When looking down from the Pampa de Achala one can imagine that man would have chosen the area even in prehistoric times. It is a bastion dominating the whole area and is rich in refuges and hunting potential. Archaeology confirms this with finds of stone points in the rock-shelters, and morters in the base rock. These were in all likelihood bases for hunting guanacos and their young in summer months. One of the earliest dated sites in the country, at 11000 years before the present, is in this region.

Descendants of those first peoples are the Comechingones and Sanavirones. They cultivated maize, beans and pumpkins, irrigating their crops via ditches. The extent of their cultivations amazed the Spaniards. They also herded llamas and to a lesser degree hunted and gathered.

As from the XVIIth century Spaniards and the Criollos descended from them have used the hills for cattle breeding. At present the residents of Achala and the larger range of mountains, known as "serranos", keep to a traditional way of life on smallholdings or as fence-riders and farm labourers; their families carry out subsistence activities such as growing vegetables, sheep, cattle and domestic fowl, while handicrafts especially weaving on primitive looms and leather-work, are an important part of their economy.

Talampaya
National Park



The sky is of an intense blue, the canyon walls are sandtone red, a condor glides by, serene and silent – it all takes us back to some bygone era. On the very border between the provinces of La Rioja and San Juan the catchment of the Campos de Talampaya is contained on the west by the Los Colorados formation and on the east by the Sierra de los Tartajos, and in which the Talampaya river, nearly always dry, has carved the impressive canyon. This is the stage for a wide panorama of singular profiles and colours, deep gorges and the imposing Famatina massif jutting upward to the north. Water and wind have eroded the sandstone, creating whimsical figures that stand out against the sky to present us with a unique surrealist setting.

Talampaya National Park protects a sector of the Ischigualasto-Villa Union watershed that it shares with neighbouring Ischigualasto Provincial Park in San Juan. also known as Valle de la Luna. Towards the end of the year 2000, UNESCO added these two parks to their

The more imposing geo-shapes of Talampaya. *Top left corner:* Cliffs. *Top left:* Grey Fox. *Top right:* Petroglyphs.

World Heritage list because of the most complete fossil record of vertebrate evolution during the Triassic period therein contained. Especially in Talampaya has been found a long series of fossils of the early dinosaurs (the most important being *Lagosuchus talampayensis* that lived here some 250 million years ago), and also turtles (*Palaeocheris talampayensis*, 210 million years). These discoveries have conferred international recognition on the area.

Most of the visitor services depart from the bottom end of the canyon, 14Km from the park entrance on Rt 26. Guided tours in vehicles, visiting the most outstanding features, are the traditional option. On the way one sees the intricate geomorphic forms that line the route - the Monk, Cathedral, Tower, Three Kings - or walks up a very narrow gorge with a ghostly stream that every now and then emerges at the surface to form puddles and give rise to

Talampaya
National Park

green patches contrasting with all the surrounding aridity. On the tour some of the evidence of early human occupation, such as walls covered with petroglyphs, morters in base-rock, amaze the visitor with a suggestive combination of mystery and beauty.

Perhaps one of the most striking places is Ciudad Perdida, a maze of canyons and gorges of varying colours that resembles the lay-out of a medieval city. A stroll through the area rewards the visitor with overhangs, strange forms, and the ever-changing play of light and shadow.

The desert landscape has the stunted, sparse and scrubby vegetation of the Northern Monte biome with the characteristic creosote bushes, a local "broom", the green-barked brea- wattle, and cactuses such as the puqui and cadoon candelabras. On the slopes of the hills grows the chica, a stunted and gnarled "tree" endemic to La Rioja, San Juan and San Luis provinces. There are some patches of open woods where roots can reach the underground water.

As for wildlife, the visitor will cross paths with grey foxes, black-legged seriemas and the chalk-browed mockingbird. Several birds of prey (condors, black-chested buzzard-eagles, peregrine falcons) use the prominences as look-outs and resting-places, while the mountain vizcacha and chinchilla rat find refuge at the base of the canyon walls. Within the park there are populations of guanacos and lesser rheas. These timid species are sometimes seen outlined against some horizon, or fleeing.

Useful Data

Talampaya National Park

The national park was created on 11th June 1997 under national law Nº 24,846 and is in the Northern Monte eco-region. It covers 215,000 hectares. The name is the original name of the area and means "the dry river of the 'tala'" (a tree of the *Celtis* genus). Points of interest - the visitor's centre, petroglyphs in the site museum and on an interpretive trail, "Botanical Garden" (Jardin Botanico) where, within the protection of the canyon walls, there is a grove of various species of trees and bushes, the Cathedral, Tower, the Monk, and other such reminiscent formations produced by erosive forces; Los Cajones, Ciudad Perdida and Cañon del Arcoiris (Rainbow Canyon). To reach the park from La Rioja or Cordoba cities, drive Rt38 to Patquia, then Rts 150 and 26 to the park entrance (214 and 485Km respectively). Both Cordoba and La Rioja have bus services from all over the country and regular flights. Both cities have car rental facilities and tour operators. One can also travel to Villa Union on the regular bus services from La Rioja, and take an excursion from there. Private vehicles are allowed as far as the service area. The park may only be visited with a licensed guide and the price of entry is deducted from the cost of the excursion. Opening hours: 9am to 5pm (1st May till 30th September), 8am to 6pm (October to end of April). In the park there is a bar/restaurant, a store and a primitive camp-site with bathrooms and showers. Pagancillo, 30Km north along Rt 26, has hostels and places to lodge in private homes, a camp-ground, restaurants, stores and a service station. In Villa Union which is 70Km north of the park along the same road, there are all manner of services, including a 4-star hotel. The climate is warm and dry with great daily temperature variation and strong sun. Maximum temperatures go over 50ºC in summer, while in winter there are frosts down to -7º. Rainfall is up to 170mm annually with torrential cloudbursts in summer months. Winds are constant, the Zonda north wind being the most violent. Year-round is good to visit the park but in January and February cloudbursts cause torrents in the river and over Holy Week there are so many visitors that there is a limit when the carrying capacity is reached. Nearby attractions include neighbouring Ischigualasto Provincial Park 65Km south along Rt 26, also a World Heritage Site, the Cuesta de Miranda, an impressive stretch of Rt 40, 70Km between Villa Union and Chilecito, and Chilecito itself with its vinyards and a cable-car on Cerro Famatina, and an interesting museum.

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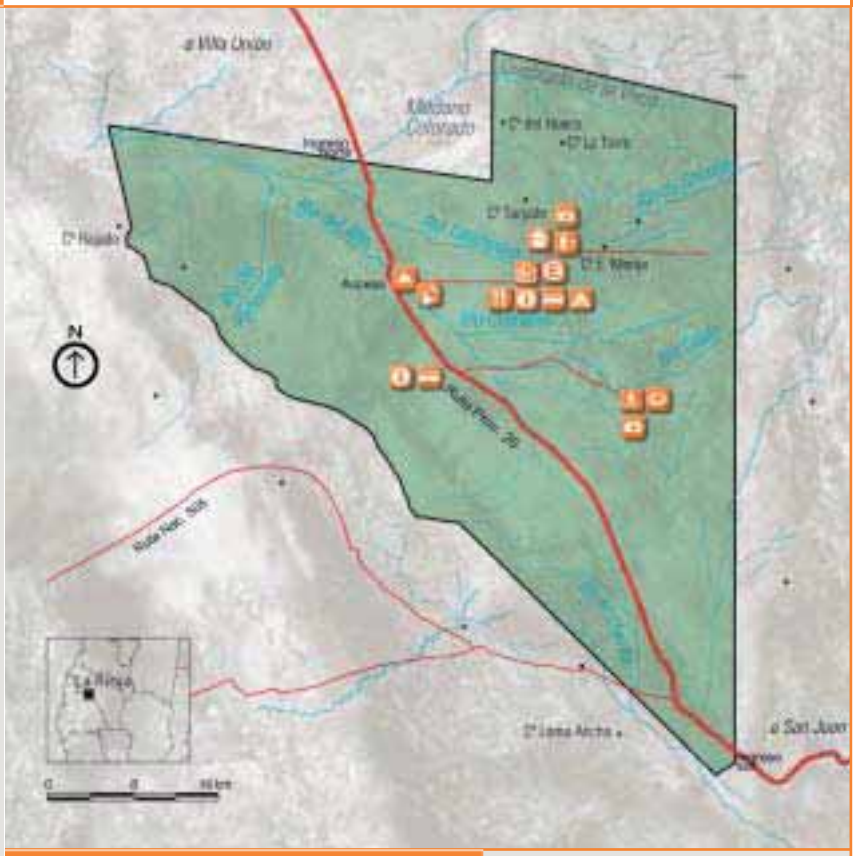

Recreational Activities

Cycling and hiking

There are various ways to see the beauty of the park, to dive into the deep silence of its rock-walls and desert horizons. For example the guided bicycle tours that visit part of the Talampaya canyon. One of these, two hours long, goes as far as the Botanical Garden. The longest, of three hours pedalling, advances as far as La Catedral formation. You can also hike with a guide, easy (3 hours) or strenuous (5 hours). All these outings can be arranged at the main entrance of the protected area where the visitors' centre and bar/restaurant are located. Hats are recommended, as are sun-block lotion and sufficient drinking water.

Another suggested excursion is to Ciudad Perdida and Arcoiris (rainbow) canyon, destinations of singular scenic beauty. These excursions include the pick-up ride out and back and a walk of over two hours, departing from a booth on Rt 26 at Km133.5 and are arranged for right there.

Species of Values

Brea-wattle
(Cercidium praecox)

This smallish tree is easily recognized by its uniformly bright green bark on trunk, branches and twigs, and the zigzagging branches. It can reach a height of 9 metres and have a 30cm diameter trunk. Adapted to dry environments, it grows from Salta and Formosa provinces as far as northern Patagonia, including parts of the Dry Chaco biome, Cuyo (San Juan and Mendoza provinces) and Cordoba province. Foliage is sparse and twigs thorny. It flowers at the end of September before putting out leaves – brilliant yellow flowers cover all the branches and twigs; The seed-pod is a lovely rich brown. The spongy wood is no use for burning or making charcoal or furniture. When scored it exudes a sticky resin used in carpentry and in making cardboard. This resin is ambar-coloured and sweetish.

Land Tortoise
(Chelonoidis chilensis)

The scientific name of this species simply means Chilean tortoise and is due to an error. The first specimen described, in Europe, came from the Chilean port of Valparaiso but the species only lives on our side of the Andes, in arid and semi-arid regions. Of the same genus as the Galapagos giants, it hibernates in autumn and winter in burrows it digs itself. In summer, during the heat of the day, it also seeks shade in a burrow. It feeds on cactus, tough grasses, flowers and the seeds and pods of the local mesquite (Prosopis alba). It also swallows small stones as a source of the calcium it needs to grow its shell. It can grow to 27cm long, 15 wide. Under and in its shell it has survived as a species for many millions of years, defended against the attacks of predators of all kinds. But its shell is no defence against advancing agriculture that daily reduces its habitat. Nor is it effective against a misguided fondness that places it amongst the favourite pets in Argentina. Owing to these pressures it is on the list of endangered species.

Black-Legged Seriema
(Chunga burmeisteri)

The loud calls of this species, emitted in chorus by three or four individuals, are the sounds of dawn and dusk. It prefers running to flying. The long black legs that take it at speed through the scrub are proof of this terrestrial preference. Over half a metre tall, it has short rounded wings, a chicken's bill and long tail for a rudder. Brownish grey in colour, there are marked white brows that highlight its large shining eyes. It rests in trees where it also nests in spring and summer. Two or three eggs are tended by both male and female birds. The diet is very varied - from rodents and lizards, snakes, insects and larvae, grass and seeds.

Art in the open

Under the open sky, ancestral artists gave expression to their inspiration and left us an impressive exhibition of petroglyphs carved into the stones of Talampaya, on walls, rocks and shelters. This is one of the most important collections of indigenous rock art in the country. Studies indicate that the area was home to temporary and seasonal settlements; dwellings, storage places and burial sites have been identified and dated at between 2500 and 800 years before the present. It is supposed that the canyon was for centuries an important trade route through the region.

Rock art in the park is often found in association with morters and stone structures. Most of the petroglyphs are sited at the mouth of the canyons and gorges. It is therefore believed that they represent itineraries or routes to reach certain areas. At Los Pizarrones (the blackboards) which is a flat surface of over 15m in length on the Talampaya canyon's walls, are depicted innumerable anthropomorphic, zoomorphic, geometric and abstract figures. They were engraved over a long period of time, including historic times when cattle drovers left motifs associated with cattle brands. At present work is being done for their conservation. At nearby sites it is possible to find engravings of figures that might be caravans of llamas and some that are evidence of the contacts between the original peoples and the invading Spaniards.

San Guillermo

National Park

Isolated, solitary, extreme – all adjectives that can be applied to San Guillermo National Park. Very hard to reach, it is the scenic beauty and the possibility of close contact with spectacular nature that make it worth the effort. San Guillermo offers fantastic skies, untrampled landscapes, peculiar flora and abundant fauna, all adapted to the very harsh high mountain conditions, and against a backdrop of eternally snow-capped ranges.

In San Guillermo is the southern tip of the Puna, a wedge that penetrates from the north as far as the northern corner of the province of San Juan. The altitude at around 3,900 metres above sea-level, dictates a rigorous environment. The inter-montane plateau runs between the high Andes and the Punilla ranges. Known as Los Leones, Los Hoyos and San Guillermo, these plains themselves are above 3000 metres and cover more than a third of the protected area. They are cut in places by canyon-like valleys such as the Alcaparrosa, with a depth of 1,100 metres.

Man has passed through the area from remote times. Though the Incas left the most evident remains with edifications and portions of the Inca Trail (see p 161), archaeological research has determined man's presence here from 8000 years before the present.

San Guillermo National Park was created principally with the protection of the last important herds of vicuña in Argentina in mind. Only a few decades ago the species was severely endangered but today, happily, it is on its way to recovery. Some 7000 vicuñas are estimated to live in the park, and another 5000 guanacos live with them. The national park is the largest sector of the San Guillermo Biosphere Reserve of over 800,000 hectares. At present open-pit mining over large areas of the reserve is the most serious threat. Mining in protected natural areas requires environmentally sound practices on the part of the mining companies, together with strict control on the part of government agencies responsible.

On the plains in the park it is possible to observe hundreds of vicuñas wandering around in search of their favourite fodder, tending their young, and even living amicably with large herds of guanacos. With amazing frequency pumas can be seen on the fringes of these herds, awaiting any opportunity. The best observation point is the elevation overlooking the Los Leones flats that, surprisingly, is not named after

Typical San Guillermo landscape. *Top right:* Los Caserones Bottomland. *Top right:* Andean lizard.

San Guillermo
National Park

the South American "lion" but after a low cactus whose shape and tawny bristles reminds one of the mane of those animals. From that same look-out one can also see flocks of puna rheas.

Most displacement is in a vehicle and only driven by those with experience of rough going. But there are foot-trails at certain points along the track. These lead to places of great beauty. In Los Caserones, for example, the landscape is seen framed by rounded basalt extrusions and shows the vibrant green of the swampy valley-bottom against the deep blue of distant mountains and the intense blue of the sky. This trail runs for 900m to a damp seep on the floor of a valley where a stream is born. Beside the trail one can find mountain vizcachas and red foxes while flocks of yellow-finches fly about.

The park is also home to colourful lizards such as the San Guillermo, green and armadillo-tailed "chelcos". Plants are adapted to long periods of lack of water and frequent snow-storms. As a result most vegetation is in the form of stunted bushes or "cushion" plants hugging the poor soil, but there are many species of tiny plant with huge colourful flowers as is common in high mountain habitats. An endemic species is the daisy known to science as *Huarpea andina*.

Useful Data

San Guillermo National Park

The area was declared a national park on 13th January 1999, under national decree Nº 25.077.
It is in the ecoregion of the Puna and High Andes with patches of Northern Monte, protecting an area of 147.830 hectares. The name comes from the San Guillermo flats that are within the park. Points of interest are the Los Leones plain where herds of vicuña and guanaco are seen; the Arroyo La Cueva green valley-bottom 2Km from the refuge at Agua del Godo, where there is abundant wildlife, ancient stone corrals and views of the mountains. El Iman, the highest point in the protected area at 5467 metres above sea level; a Panoramic view point at 3.600 m on the circuit that leaves from the Agua del Godo refuge; the Alcaparrosa valley and the Inca remains (tambería), at the southern entrance to the park. The park is only accessible in four-wheel-drive vehicles. From San Juan take Rt 40 to Rodeo (195Km). From there to the Agua del Godo refuge after 130Km of track that follows the Blanco river and crosses it eight times, then climbs up the Alcaparrosa valley. In the provincial capital of San Juan, where there are bus services from all over the country and daily flights from Buenos Aires, it is possible to rent 4x4 vehicles (Rosa 4x4, tel. 0264-4210800; y Renta 4x4, tel. 0264-4277373). No entrance fee is charged. It is advisable to travel in convoys of at least two vehicles. For lodging, food and petrol, the park only has a mountain refuge with two rooms and basic bathroom facilities (Agua del Godo), and one may camp in the vicinity (because of the high winds make sure the tent is properly tied down). Rodeo, 130Km from the refuge, has hotels, restaurants and service stations. In Tudcum, Las Flores, Angualasto and Malimán, localities on the road from Rodeo to the park, there is lodging to be had in family homes and places to camp. In El Chinguillo, half way, home-cooked food can be obtained and camping is allowed. The climate is cold and dry with great daily temperature variation (up to 35ºC); average summer temperature is 15ºC (with frosts) and 1° C in winter (mínimum -15° C); 30 to 100 mm of annual precipitation fall mostly as downpours in summer; there are frequent snow-storms in colder months; winds gust at over 120 kph. The best times to visit are autumn or spring as summer rains and snow-melt from the high mountains cut all access. Nearby attractions include Villa del Rodeo; Pismanta thermal waters (hotel with baths restored and operated by the employees, 25Km from Rodeo); in Tudcum, Angualasto y Malimán, on the access road, there are high quality spinners and weavers of ponchos and rugs.

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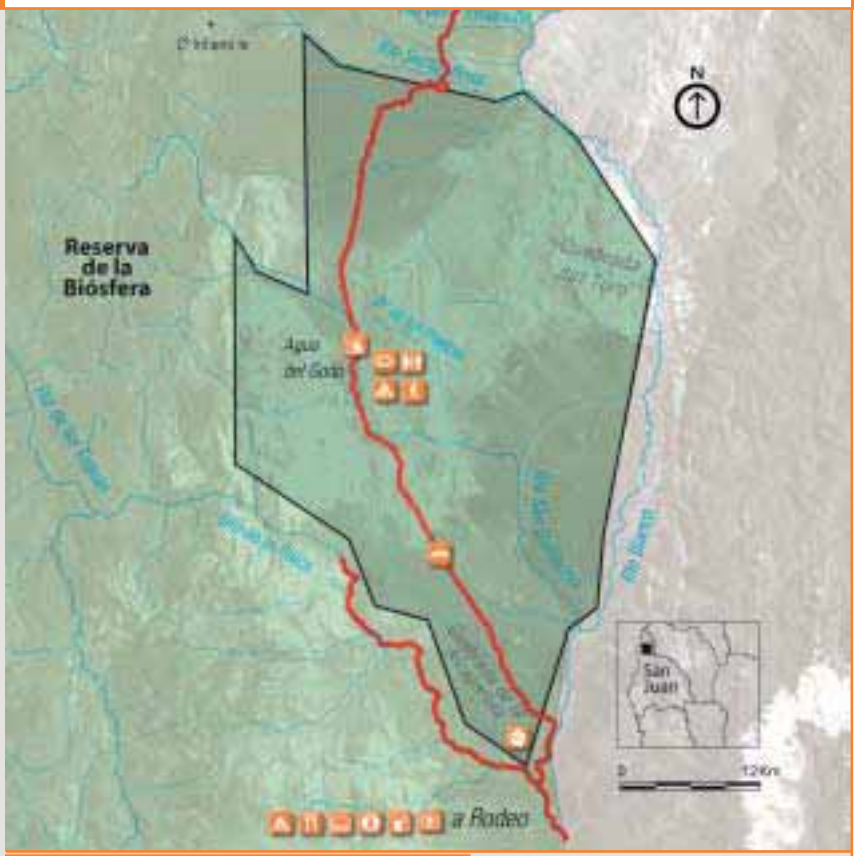


Recreational Activities

All-terrain motoring and wildlife observation

San Guillermo is a demanding environment, suitable for adventure, that is reached along steep and difficult tracks in 4x4 vehicles. It is mandatory to inform the park HQ in Rodeo of your intentions and take an authorized guide who can be hired on the spot (call 02647-493214). Any visit to the park requires at least three days - one to arrive and acclimatize, another to reach the points of interest and see the park, and the last for the return. The stretch between Rodeo and Agua del Godo refuge is the main challenge. It takes at least seven hours, crossing the Blanco river eight times and climbing very steep gradients where there are loose stones, washouts and deep runnels. It requires an experienced driver and well-maintained vehicles. On the way the Alcaparrosa valley is the most complicated stretch. The depth of the river at the fording places must be carefully studied as seasonal freshets in rivers and streams, from snow-melt and downpours can raise water levels dangerously (up to 15m).

The protected area has tracks for vehicles. One is the El Mirador circuit that climbs for ten kilometres between mountains and grassland to the final stretch at 3800 metres above sea-level. A short walk takes one to a sector with viewing points and walking trails along the edge of the Los Leones flats. One can also drive over those flats in the 4x4, giving a unique opportunity for a photographic safari as the large animals (guanacos, vicuñas and rheas) are easily viewed. There are set hours for this activity so as not to molest the animals: 3pm till 9pm in summer, and 3pm till 7pm in winter.

San Guillermo
National Park

Species of Values

Andean Cat
(Oreailurus jacobita)

This mysterious cat has challenged scientists and naturalists. Little is known about it in spite of the fact that it occupies a vast region in the Andes of Argentina, Chile, Bolivia and Perú. There have only been isolated observations of the species, very few photographs and a scattering of skulls in museum collections. Not even its weight is known with any certainty, varying between 4 and 7 kilos. Its most notable characteristic is the long bushy tail with between 6 and 9 dark rings. The ground colour of the pelage is ashy brown with yellowish brown stripes along its sides, and dark grey barring on cheeks and forelimbs.Its pads are covered with hair as a protection against the cold, as in the more famous snow leopard, and it has very accute hearing because in the extremely dry air of the mountains scent is of little use in hunting. That hearing helps it to catch the silent mountain vizcachas as well as their smaller relative, the chinchilla.

Vicuña
(Vicugna vicugna)

The vicuña is a good example of adaptation to the environment. Smaller than the guanaco or llama (50 kilos), it flourishes on the meagre fare of the high Andes and the Puna. Its chambered stomach can process even the most fibrous plant material, its razor-shapr incisors cut the plants and do not uproot them, thus making for sustainable use of the vegetation, and its cushioned toes tread the soil without eroding it. A double fleece (with the finest fibre in the animal kingdom) protects it from the most intense cold and its colour from the vision of predators. The rarified air of such elevation seems not to affect it - it can run for long periods at speeds up to 47kph. The secret lies in the haemoglobin that is efficient in capturing oxygen, and the elliptical red corpuscles (a design shared only by amphibians, reptiles and other members of the camel family to which the vicuña belongs) that ensure a better distribution.

Yareta
(Azorella sp.)

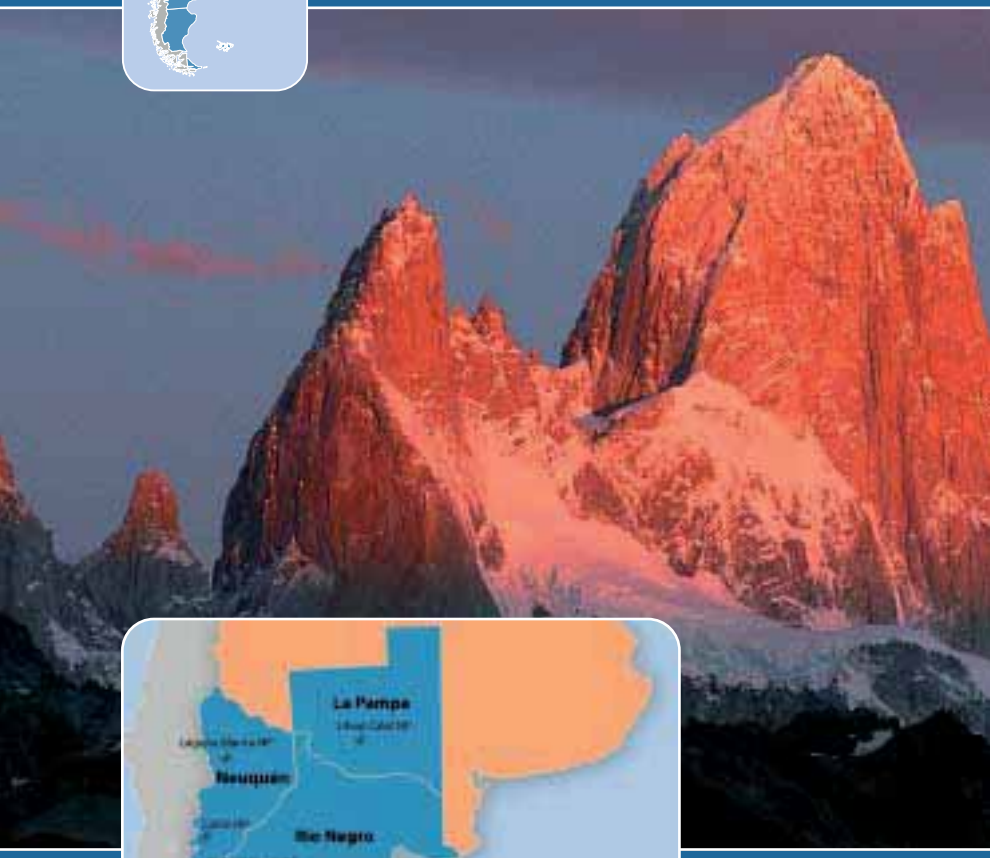
Looking like a stone, it is hard to believe that this plant is related to the carrot and celery. The twigs and leaves form a hard cushion that is resistant to being trampled on by several people at a time without suffering any damage. This compact form is the result of efficient adaptation to the Puna environment, dominated by cold, extreme aridityand high solar radiation. The yareta only grows in full sun and does so very slowly (2mm per year), so it takes centuries to develop. The minute yellow flowers are hardly noted on the carpet of tough leaves. Locals use it for fire-wood and must use a pick to harvest the very hard "wood". For many years it was used as fuel for artesan mining operations and thus no longer exists in vast areas of the region.

Fibres for the Inca

The Incas who dominated this territory as from about the end of the XVth century, found in San Guillermo a interesting source of raw materials for their metallurgy, especially lead, and also vast herds of vicuñas. The fibre from this animal, the finest in the world, was reserved for weaving garments for the aristocracy. To facilitate access to these resources they built a network of tracks through the region, the main one entering from Guandacol in La Rioja province and heads towards the Andean passes. They also raised stone buildings called "tamberias" and corrals, especially at the northern end of the upland plains of San Guillermo, near the grazing area where even today vicuñas are abundant, and in the passes through the enclosing ranges, to be able to control the movements of the herds.

Mountain Caracara
(Phalcoboenus megalopterus)

With its strong beak and black and white plumage, this inhabitant of the high Andean plateaus (though sometimes seen as low as the Pacific coast) is distributed from southern Ecuador to central Argentina and Chile in areas with sparse vegetation between 2.900 and 5.000 metres elevation. Though mainly a carrion feeder, it also preys on small birds and mammals. It extends its diet to insects that it grubs up from the soil. Both sexes are about 50cm long. Between October and December it lays two or three eggs in nests in the rare bushes or on a ledge on bank or cliff. By March the young can look after themselves.



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Tierra
del Fuego

Patagonia

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Nahuel Huapi
National Park

On 6th February 1903 Francisco P. Moreno donated three square leagues of land to the Nation for their conservation as "a natural public park". This was the seed of our first national park and thanks to its present 709,886 hectares, the second largest. Moreno identified within its borders "the most interesting compendium of natural beauty in Patagonia". He knew what he was talking about. Landscapes such as those at Puerto Blest, Laguna Frias, Los Alerces waterfall, Isla Victoria, Lago Mascardi or the Valle Encantado are incomparably seductive. Around the foot of the 3554 metres of Mt. Tronador, the highest peak in the national park, lies one of the masterpieces of the Creation.

This enchanted geography is complemented by the availability of tourist centres that exist thanks to the park (San Carlos de Bariloche, Villa La Angostura y Villa Traful), where the visitor has access to many services, both in lodging or in recreational activities and tours. The array of Nahuel Huapi's possibilities seems endless and certainly cannot be exhausted in a single visit:

Nahuel Huapi Lake. *Top left corner:* Rock painting at Traful lake. *Top left:* Bariloche Civic Centre. *Top right:* Pudu.

one has to return and again get to know this marvellous region. Hikes, climbing, fishing, excursions on the water, photography, or the simple pleasure of enjoying nature. There is lots to do for every taste. Hardly surprising then that the protected area receives hundreds of thousands of visitors each year.

On this side of the western back-drop of mountains, snow and wind, there is an intricate pattern of lakes left by the glaciers as they withdrew. Nahuel Huapi lake is the main body of water, 560 square kilometres in surface area and a depth greater than 400 metres. It is the centrepiece around which the enchantment of the park spreads. Private craft and excursion vessels cruise its waters; its shores are dotted with beaches, bathing spots and jetties.

The lower mountains and valleys are cloaked in woods where the lenga *(Nothofagus pumilio)*, ñire *(N. Antarctica)* and coihue *(N. dombeyi)* all grow. Flowers, red of the Chilean fire-bush, orange *Mutisias* and

Nahuel Huapi
National Park

yellow *Alstroemerias*, are a show in summer. Towards the east the woods are more open, dominated by the austral cypress and the ñire, till they give way to the steppe where grass and bushes dominate, such as the neneo and Stipa bunch-grass. The high rainfall in the area of Puerto Blest, tucked under the Chilean border, gives rise to the interesting Valdivian rainforest presided over by the crowns of the Guaytecas cypresses *(Pilgerodendron uviferum)*, the fuinque *(Lomatia ferruginea)*, a podocarp, maniu hembra *(Saxegothaea conspicua)* under all of which there is a dense undergrowth. In this forest there are magnificent, gigantic and thousands of years old Lahuans *(Fitzroya cupressoides)*.

The biological variety in the park is surprising. There are over one thousand species of higher plants and 334 vertebrates. The list includes threatened and endangered species such as the huemul Andean deer, the Chilean pigeon and the south Andean otter, and oddities like the monito del monte (a tiny nocturnal marsupial), the elusive güiña cat, and the pudu (world's smallest deer). Nahuel Huapi is also the only place on earth to find the Challhuaco frog and the colonial tuco-tuco *(Ctenomys sp)*. To all this must be added a fantastic cultural diversity. In the region, communities of Mapuches, Creoles and Europeans all co-habit. There are even the descendants of a genuine Texan cowboy. Not surprising. "The most interesting compendium of natural beauty in Patagonia" has an ecumenical attraction.

Useful Data

Nahuel Huapi National Park

The park was created on 29th September 1934, by national law Nº 12.103. It is in the eco-region of the Patagonian Andes Woods, Patagonian Steppe and High Andes, covering an area of 709,886 hectares.

The park takes its name from the main lake and this in turn from the Araucanian name for what today is Victoria island - Nahuel (Jaguar), Huapi (island). The jaguar was a totemic figure to the Mapuche people, (or perhaps also the local otter also known as the "tiger of the water").

Points of interest are the Nahuel Huapi lake and Isla Victoria, Puerto Blest, Laguna Frías, los Cántaros waterfall, Mt Tronador, Cerro Catedral (Frey refuge), The Seven Lakes circuit (de los Siete Lagos), Lakes Gutiérrez and Mascardi, Los Alerces waterfall, Lakes Hess and Steffen, Manso river, Lake Traful, Enchanted Valley (Valle Encantado) and its amphitheatre. To get there, Bariloche is in the heart of the national park and has flights and busses from all over the country. In cars, from San Martin de los Andes take Rts 234 and 231 (The Seven Lakes circuit) or Rt 63; from Neuquen Rt 237. There are three international passes to Chile, two over land (Puyehue, Rt 231, and Cochamó, Rt 83) and one over water (Pérez Rosales). There is an entrance fee charged (valid for 48 hours) and reduced prices for national tourism, provincial residents, university students; pensioners, children under 14 and local residents are free. For lodging, feeding and fuel, there are 18 places to lodge within the park (hotels, cabins, estancias y inns), 5 mountain refuges, 6 concessioned camp-grounds and 16 sites for open camping. Bariloche and Villa La Angostura have all manner of tourist services. The climate is cool and damp, high mountains cold and snowy, the steppe dry and windy. Average temperatures 0º C in winter and 10,7º C in summer. Precipitation is mostly in winter (3.000 mm in the west and 600 mm on the edge of the steppe). It can snow between May and September. There is much variation with elevation: higher it is very cold, frequent frosts and snow nearly year-round.

The best time to visit is from end of spring to early autumn. Nearby attractions are El Bolson (125 km south of Bariloche, via Rt 40); Los Arrayanes National Park within Nahuel Huapi; Lanin National Park (contiguous to the north; San Martín de los Andes where park HQ are, is 153 km from Bariloche); Lago Puelo National Park (16 km from El Bolsón); Villa El Chocón (342 km from Bariloche, on Rt 40, with its interesting paleontological museum and the dam itself).

For further information:
Intendencia Parque Nacional Nahuel Huapi,
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Tel (02944) 423111,
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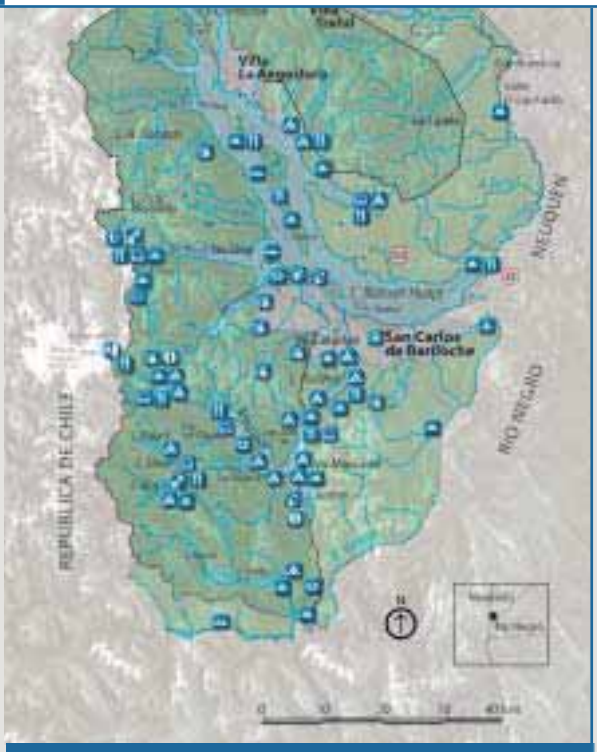


Recreational Activities South

For all tastes

The southern part of the park is perfect for lovers of outdoor sports. In the park HQ you can get information on excursions and outings, from hikes and drives for the whole family to demanding mountaineering, lake excursions, rafting and kayaking for all levels. All this in a marvellous natural setting.

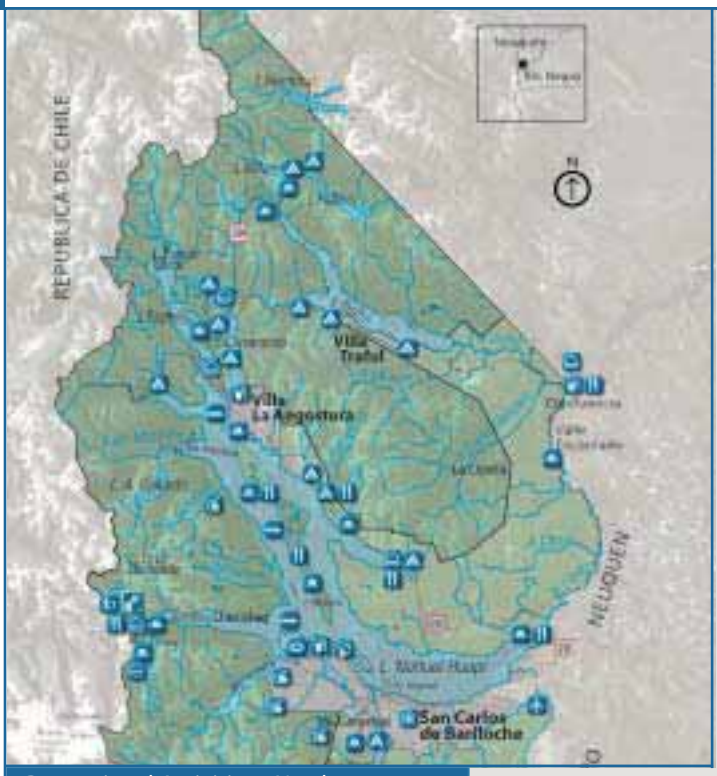
Discovering lakes. There are several drives in the south of the park for stopping wherever the scenery takes your fancy. One of the more popular is the road that links lakes Gutierrez, Mascardi, Hess and Fonk, ending at the famous Los Alerces waterfall. One can also follow the coast of lake Mascardi to reach Pampa Linda, at the foot of Mt Tronador where there is a choice of several walks.

Nothing tame. The Manso (tame) river is misnamed; it is the favourite for white-water buffs. Its source is at the foot of the glaciers on the eastern face of Mt Tronador and it ends up joining the Puelo river to spill into the Pacific. This whimsical course takes its waters through lakes Mascardi, Los Moscos, Hess and Steffen. In the different stretches one can contract licensed tour operators for gently drifting downstream in a kayak or rubber raft, that usually takes half a day. The lower Manso, near lake Steffen has class II and III rapids, with sandy beaches backed by woods; it is the gentlest of courses, special for enjoying an adventure with the family. For a rafting expeditions, the middle Manso with class III y IV rapids, offers action, with cascades, waves and a famous toboggan. The most daring (and fit) take the lower Manso to the frontier, turbulent water (class III y IV), narrow gorges, this is high adrenalin rafting.

In the shadow of Mt Tronador. This mountain reaches 3554 metres above sea-level, the highest point in the park. The name comes from the noises produced by the constant avalanches from the glaciers that descend from the peak (Tronador = thunderer). There are numerous activities for treks around the area. One leaves from Pampa Linda, the valley leading up to the foot of the mountain, which, after 8 Km, reaches the Ventisquero Negro (Black Glacier) where falling ice from the Manso glacier can be watched. Another alternative is a visit to the Otto Meiling mountain refuge at 2100 m elevation and 18 Km from Pampa Linda (5 hours uphill) from where all the majesty of the glaciers can be seen. This refuge is the starting point for attempts on the three peaks (Argentino, Chileno and International).

The Frey to Jacob crossing. This mountain trek is some six hours long and joins these two traditional mountain refuges along well-marked trails that offer spectacular views. Leaving the Frey refuge one follows the coast of Tonchek lagoon and climbs to Schmoll lagoon and the one called Cancha de Futbol (Football Pitch) with surrounding rock formations that resemble grandstands. Then, crossing the Rucaco valley, one climbs the Brecha Negra peak to Jakob lagoon where the refuge is sited.

Nahuel Huapi
National Park



Recreational Activities - North

A labyrinth of lakes

In the northern region of the park there is a complicated set of interconnected lakes that spreads into neighbouring Lanin National Park As well as all manner of boating excursions, in many types of craft, the area offers drives on the roads that explore the woods and follow the shores of the lakes.

Drive through the woods.

The park has part of the Seven Lakes (Siete Lagos) circuit that runs between Bariloche and San Martin de los Andes, through Angostura. There are 174 kilometres of pure visual joy (50 are gravel but being paved). The road links up several lakes, through enchanted woods, streams and cascades that demand continuous stops for enjoyment. The most notable lakes are Falkner, Villarino, Correntoso, Espejo, Lacar and Machonico (the last two in Lanin National Park). On the return an alternative route is via Traful, along the shores of that lake and the delightful neighbourhood of Cuyin Manzano. At Confluencia, Rt 237

heading for Bariloche passes all the fantastic geological formations and whimsical shapes in the Valle Encantado. And the Amphitheatre of the Limay river.

Over the waters to Chile. Most lake excursions start from Puerto Pañuelo on Nahuel Huapi lake. The most popular of these take all day and visit the Arrayanes myrtle woods on Quetrihue peninsula, also disembarking for a visit to Isla Victoria where the old pine tree experimental nursery is, rock paintings, trails through the woods and a chair lift to Balcon Maravilla on Cerro Bella Vista. Other excursions head for Puerto Blest at the western end of one of the arms of the lake where one visits the impressive Los Cantaros waterfall. Also from Puerto Blest there is an extension to Laguna Frias, almost on the border with Chile. Some tour operators offer to take one onward to the Pacific over this route, with alternating busses on land and launches on lakes.

A fisherman's paradise. Lovers of sport fishing dream of wetting their lines in any of the waters of the region. There are places of world renown, such as the mouth of the Correntoso river (between lakes Nahuel Huapi and Correntoso, surely the shortest river in the world), and the Ragintuco and La Estacada streams near Angostura. Near Villa Traful the rivers Machico, Traful, Pichi Traful are famous. Fishing is only allowed with a permit (daily, weekly or seasonal) that is obtained in the Park HQ and other authorized places (there are discounts for residents; it is free for the handicapped, anyone over 65 or under 12). Fishing is only allowed during day-light hours and in due season (in Patagonia usually between 1st November and 1st May). In the Patagonian parks there are waters where fishing is forbidden (these are listed in a pamphlet handed over with the fishing permit). Only the introduced species may be taken – brown, rainbow and brook trout. In lakes and lagoons one is allowed to keep one fish per day per fisherman, but in November and May all fish must be released. Any native fish and all Atlantic salmon must be released promptly and as gently as possible. Only artificial lures may be used (no batteries) with a single hook (one, two or three points) but no barbs. Spinning, fly-casting and trawling are all allowed; motor-boats may be used (there are exceptions). No fishing from boats is allowed at the mouth of rivers or streams. Underwater fishing, nets, harpoons and multiple hook lines are also forbidden as is all commercialisation of any fish caught.

Nahuel Huapi
National Park

Species of Value

Imperial Cormorant
(Phalacrocorax atriceps)

Colonies with great numbers of these birds are very common on the Patagonian sea-coast. Three exceptions there are to this rule, constituting inland populations in the Andes. One of these - only about 150 birds - is on Nahuel Huapi lake, at various points on the coasts of Victoria and Fray Menendez islands. Elegant in its black and white plumage, the imperial cormorant is some 60 cm long. It feeds on fish, and invertebrates. Nesting is in permanent colonies, usually on ledges of small cliffs; the nest itself is of plant material all cemented together with the birds' guano. It is very attentive to its chicks.

Austral Cypress
(Austrocedrus chilensis)

*The silhouette of this conifer is unmistakable, with its straight trunk up to 35 m in height and conical shape. The leaves are like small scales. The species grows in the north of Andean Patagonia from Neuquen to the Corcovado river in Chubut province. Usually it is found in the drier woods bordering on the steppe as, of all Patagonia's trees, it can best support conditions of little humidity. However, there are also patches of large specimens of this species in dripping Puerto Blest. It grows slowly and faces a number of problems: encroaching cattle, forest fires, the expansion of forestry with exotic species, and its over-harvesting for its fine wood that is pale-coloured and resistant to water, much used in the construction of houses. It is calculated that woods of this species, often with others (especially ciohue, **N. dombeyi**), cover some 140,000 hectares and only half of these are in protected areas.*

Water regulation

The woods that Nahuel Huapi protects are essential for regulating water-flow in northern Patagonia. On these depends not only the availability and purity of the water that is drunk locally, but also the useful life of the hydro-electric dams down-river, along the Limay, such as Alicura, Piedra del Aguila and El Chocon, that produce much of the electricity used in the city of Buenos Aires; it also provides for the systems of irrigation in the fruit-growing Rio Negro valley. At the beginning of the XXth century, in the region of Nahuel Huapi, clearing of forests by axe and fire were habitual practices for the introduction of cattle and crops so that the soil would be productive. Thanks to the timely conservation of the habitat by National Parks, today the woods are still ensuring a steady flow of water and guaranteeing the quality of this essential element. Further, the landscape attracts over half a million visitors per year.

The South Andean Otter
(Lontra provocax)

Belonging to the family that includes skunks, weasels, badgers and mink, this otter is just that, in spite of the Abbot Juan Ignacio Molina's 1782 description that placed it amongst the beavers. It measures over one metre in length and can weigh ten kilos. Its name comes from the Araucanian ***huyli*** *(nail) and one need only look at the sharp claws to understand just why. An agile swimmer and diver, with inter-digital webs, it lives in waters on both sides of the southern Andes from Neuquen to Staten Island off Tierra del Fuego. The burrow has one underwater entrance and another opening onto dry land that is camouflaged by vegetation. Crustaceans are its favourite food, though it also sinks its teeth into fish, molluscs, amphibians and, on occasions, water-birds. Intensely hunted for its pelt, its numbers are very low and it has even disappeared form large areas of its former range. It figures on national and international red lists of endangered species and is protected by law. Nahuel Huapi National Park is home to the most important population in Argentina - hence its inclusion on the park's badge.*

Enigma on the rocks

In 1958 the engineer Asbjörn Pedersen - a Swede with a passion for archaeology - started studying the prodigious rock paintings on Isla Victoria. Centuries before, shamans or indigenous artists ground mineral pigments and added them to water and urine (ammonia is an excellent fixative), mixed others with animal grease and covered the rock-faces with zigzags, circles, lines of stairs, zoological and human figures. What most impressed Pedersen were the representations of llamas, one especially on a wall at Puerto Tranquilo, that seemed to be carrying a "funerary bundle with a solar diadem".

After patient study he pronounced that these paintings denoted a close link of those local aborigines to the "cultures of upper Peru" since llamas were not part of the fauna of Patagonia. It was the same with the finding of dogs and horses depicted, that Captain Juan Fernandez found on his first visit to the area of Nahuel Huapi. His hypothesis was that those animals, so out of context, had arrived with the 1535 expedition sent out by Diego de Almagro from Peru to start the conquest of Chile. Juan de Saavedra, who commanded the expedition, was travelling with Paulu Topa – brother of the Inca Manco -, a great imperial high priest, several nobles and fifteen thousand Indians for service and fighting.

Over time this theory has lost favour. Today we know that in central Chile, on the other side of the mountains, the Araucanians bred a variety of llama called *hueque*, and that the native cultures adopted domestic animals from Europe much faster than was to be supposed. There must be other explanations to be sought to disentangle the secrets of the paintings on Isla Victoria. Most are found in places of difficult access. But in Puerto Anchorena, the main entry-point to the island, there are llamas and abstract motifs a stone's throw away. They deserve a closer look. Contemporary retouching and a protective set of railings have not been able to dull the spell.

Some flowers of the Patagonian woods

Chilean Fire-bush *(Embothrium coccineum)*

Shrub or small tree (up to 6 m tall), many ramifications, ovoid or spherical crown, persistent foliage and very showy tubular flowers that are pollinated by hummingbirds and insects. It blossoms abundantly in spring and early summer. Is grown as an ornamental. Bark and leaves have medicinal properties, the soft wood is used in furniture-making. Prefers openings in the woods, or edges of same. Present in all national parks in the Patagonian Andes woods.

Mutisia *(Mutisia decurrens)*

Perennial climber with lanceolate leaves with bifid tendrils from the tip of the leaf. Climbs through branches of bushes both in the woods and on the steppe. Likes plenty of light and loose, dry soils, such conditions as are found on the shoulders of roads. Here the bright orange daisy-flowers are easily visible. Its sister species (Mutisia retusa) has lilac-coloured flowers, leaves with a notch at the tip and a single tendril. Both species are common in Lanin, Nahuel Huapi, Los Arrayanes, Lago Puelo and Los Alerces National Parks.

Amancay *(Alstroemeria aurantiaca)*

Perennial herbaceos plant with rhizomes and a single stem growing up to one metres tall. Its lanceolate leaves are between 5 and 12 cm long. Flowers are yellow or orange with red in showy bunches that attract hungry insects. In summer months they are everywhere, lending great beauty to the floor of the woods, mountain slopes or the side of the road. The Amancay or liuto is very abundant in Lanin, Nahuel Huapi and Los Alerces National Parks.

Two-flowered Calceolaria *(Calceolaria biflora)*

Herb 15 to 25 cm tall. flourishes on poor loose soils, flowering in spring and summer. It is pollinated by insects. Grows both on the steppe and in the woods. Amongst its common names in Spanish are "topa-topa", "zapatito de la virgen" (virgin's slipper) and "capachito" (little basket), these last referring to the shape of the corolla. It grows in most of the Patagonian Andes parks but is most common in Los Glaciares and Tierra del Fuego. There are many species in this genus and it is sometimes hard to tell them apart.

Quintral *(Tristerix tetrandrus)*

A hemi-parasitic plant - it has chlorophyll to synthesize its own organic material, so it only takes water and minerals from its host. Though it bears flowers throughout much of the year, it does so more abundantly in winter. In this season it is the only source of food for the green-backed firecrown (a hummingbird), that pollinates it in return for its favours. The little Dromiciops marsupial and fruit-eating birds favour the fleshy fruit that is abundant in spring and early summer, and in return disseminate the seed through the woods. This plant grows in Lanin, Nahuel Huapi, Los Arrayanes, Lago Puelo and Los Alerces National Parks.

Botellita - little bottle *(Mitraria coccinea)*

A climbing shrub endemic to the woods of the southern Andes in Argentina and Chile.. Grows in damp shady situations. It hangs on to the trees using the adventitious rootlets that sprout from the stem. In spring and summer it puts out brilliant red flowers, whose pollination is mostly by the green-backed firecrown hummingbird. The fruit is a green berry up to 1.5 cm across. With leaves and bark an infusion is prepared for a purge. An ointment made from the powdered plant serves for infections of the skin. It can be admired in Lanin, Nahuel Huapi, Los Arrayanes, Lago Puelo and Los Alerces National Parks.

Fuchsia *(Fuchsia magellanica)*

Many-branched round-shaped shrub with evergreen foliage, growing to 2.5 metres in height. Upright, though it sometimes leans on other species, usually found near water - streams, lake-shores or waterfalls. The whitish bark peels visibly. Fleshy fruits are black and edible. And at the end of spring or early summer the dangling flowers are showy and colourful. It is much grown as an ornamental and used for medicinal purposes. Found in all the Patagonian Andes national parks.

Wild Stawberry *(Fragaria chiloensis)*

Perennial herb up to 20 cm tall with ground-creeping stems. It thrives in clearings in the woods but in the shade. It needs high humidity. Flowers in spring, fruit in summer. The flowers have green sepals, white petals and numerous stamen.

The fleshy fruit are brilliant red when ripe and edible but somewhat wanting in flavour. This is a genus with a wide distribution in the Americas. It was crossed with F. virginiana to produce the cultivated strawberry that has such an amazing capacity for adapting that it is equally well-suited to tropical countries as it is to Scandinavia. It is present in all Patagonian Andes national parks.

Taique *(Desfontainea spinosa)*

Many-branched shrub with persistent foliage, that grows to 2 metres in height. It is an undergrowth species, preferring damp places. The stiff leaves have thorns and "teeth" on their edges and are somewhat like European holly. Flowers are red and tubular with a yellow tip. The fruit is a yellowish green spherical berry one centimetre across.

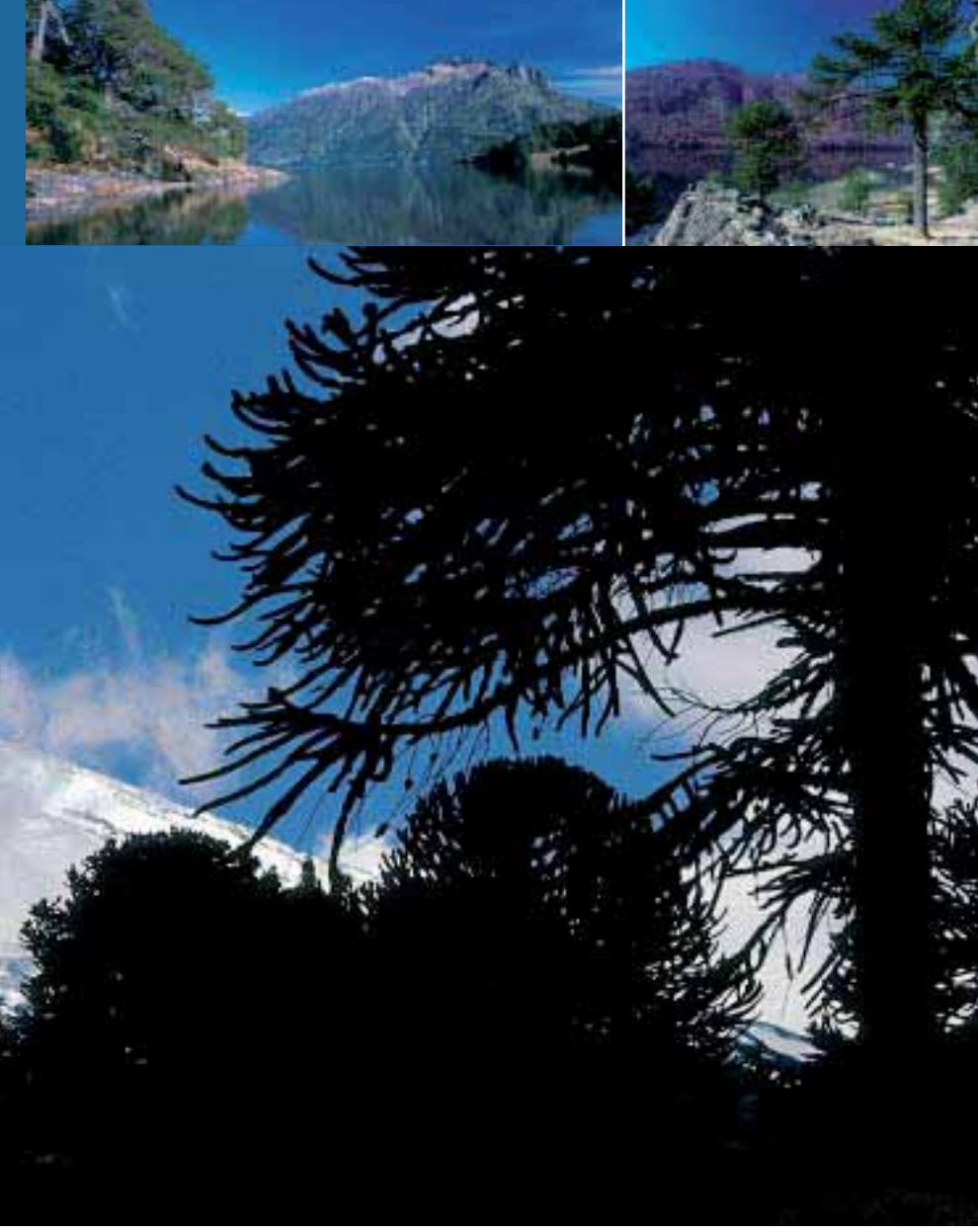
The species grows in Lanin and Nahuel Huapi National Parks, in this last adorning the track between Puerto Blest and Laguna Frías.

Dog Orchid *(Codonorchis lessonii)*

Erect herbaceous plant up to 40 cm tall, needing humidity and loose, nutrient-rich soils. Cannot stand direct sunlight so is found growing in the darker clearings in the woods. Sometimes found in amazingly profuse patches. The single flower, with white petals spread like vanes on a mill, is seen between November and February. The fruit is a dry cylindrical capsule dark violet in colour. When dormant in winter, aerial parts are completely dry. Though its northern distribution reaches Neuquen, it is much more common in Los Glaciares and Tierra del Fuego.

Lanin
National Park

Lanin takes its name from an extinct volcano that resembles Mt Fuji from many angles. Below its 3776 metres elevation extends one of the most captivating territories in Argentina. There grows a botanical heritage of vital importance for the regulation of the waters of northern Patagonia that includes a fair number of exclusive herbs and bushes, and three woodland communities of restricted distribution that are not represented in any other protected area in the country: the woods of Araucaria (a veritable living fossil), of rauli *(Nothofagus procera)* and of roble pellin *(N. obliqua)*. The fauna includes 233 species of native vertebrates, from the puma to the tiny marsupial monito del monte, from the majestic Andean condor to the green-backed fire-crown hummingbird. Fabulous rock art sites are located in Ñorquinco, Quila Quina y Filo Hua Hum. And the scenery – on which is based the incredible development of tourism in the Province of Neuquen – combines snowy



Lanin volcano, framed between Araucaria crowns. *Top left corner:* Mapuche child. *Top left:* Huechulafquen lake. *Top right:* Araucarias at Rucachoroi.

peaks, tree-covered slopes, twenty-four lakes of glacial origin and torrents full of fish.

In the northern stretches of the park await the serene beauty of lake Quillen, magnificent cascades and, surrounding lakes Ñorquinco and Rucachoroi, those centenarian *Araucaria* woods.

The undoubted star of the central sector is Lanin volcano. This can be enjoyed from beside nearby lake Tromen from where the easiest route of ascent starts, while from another angle, imposing lake Huechulafquen -the largest in the park- and photogenic Paimun lake provide unforgettable views. In this sector also are to be found the world renown trout-fishing waters such as the mouth of the Chimehuin river.

To the south lies San Martin de los Andes where the Park administration is. From there depart lake excursions on lake

Lanin
National Park

Lácar and roads that lead to dream places such as Catritre beach and Quila Quina, both within easy reach. Hua Hum, the border pass to Chile is but 44 Km along Rt 48. In that area, set in the Valdivian rainforest, is the Chachin waterfall. And 80 Km along Rt 62 the thermal springs of Lahuen-co offer a restorative bath. The whole road is a rosary of hypnotic beauty-spots. Amongst these is the lava-flow of the Achen-Ñiyeu volcano that is evidence of the eruption that eons ago divided lake Epulafquen in two. To complete the feast (and begin it again), the Seven Lakes (Siete Lagos) route heads south through woods and round lakes into Nahuel Huapi National Park.

The Mapuche Nation resistance to the "conquest of the desert", the worse genocide in the history of our country, allowed the surviving of more people than school text-books would have one believe.

Useful Data

PN Lanin

The park was created on 11th May 1937 under National Decree Nº 105.433 (ratified by National Law 13.895). It is in the Patagonian Andes woods eco-region with sectors of Steppe and High Andes. The area is 412.013 hectares. It took its name from the Lanin volcano (3.774 m). Felix de San Martin gives it as from Mapuche lan (to die) and in (feast in excess); if so the translation would be "died choking", alluding to one final eruption of this now extinct volcano. Father D'Agostini, on the other hand, opts for another Araucanian word: lanlil (dead rock). Points of interest are: Ñorquinco, Rucachoroi, Quillen, Hui Hui, Tromen, Lanin volcano, Huechulafquen, Paimun, El Escorial (lava flow), Laguna Verde, Lahuen-Co, lakes Curruhue Grande and Chico, Lolog, Lácar, Cerro Bandurrias, Quila Quina, Hua-Hum, Chachin waterfall, Queñi, Meliquina and Filo Hua-Hum. Visit the southern sector of the park from San Martin de los Andes, the central sector from Junin de los Andes and the northern from Alumine that are nearly all connected by bus with the rest of the country. The Chapelco airport, 24 km from San Martin and 20 from Junín, receive daily flights from Buenos Aires and Cordoba. From these towns all points of interest in the park can be reached by private or rented car, local bus or with the services offered by tour agents. In Alumine, the possibilities are restricted to taxis or tour companies. Lanin also has three international passes over to Chile: Hua Hum (to Pirihueico-Panguipulli-Lanco), Carirriñe (to Coñaripe-Licán Ray-Villarrica) and Tromen or Mamuil Malal (to Curarrehue-Pucon-Villarrica). There is a park entrance fee charged, with discounts for national tourism, provincial residents, university students. It is free to pensioners, the handicapped and children under 14. For lodging, food and fuel, there are 5 inns in the park, 1 bed & breakfast, two groups of cabins, 5 concessioned camp-grounds, three educational camps, 21 open camping sites, 16 tenting areas, 10 picnic and day-use areas, 2 restaurants, one fast-food outlet, two tea-houses and a café. The nearby towns offer a wide variety of lodging and feeding places, especially San Martin de los Andes, and service stations.(The service station at Alumine only takes cash). The climate is cool temperate and humid (except the high mountains with snow). Average temperatures are 4ºC in winter, 20 in summer; precipitation averages 1800 mm annually, but in parts of the mountains to the west can reach 4000 (Queñi, Quillen-Añihuaraqui). Rain is mostly between May and August, peaking in June. Snow falls between May and October. The best time to visit is between the end of spring and early autumn. Nearby attractions are Laguna Blanca National Park (NW along Rt 46), Nahuel Huapi and Arrayanes National Parks (S on Rt 234). Chapelco, 24 Km from San Martin (Rts 234 and 19) is one of the more important ski areas in Argentina with 31 runs for all levels of ability. From the town of Alumine the Pehuenia circuit takes in the magnificent scenery around lakes Ñorquinco, Alumine and Moquehue (109 Km to Villa Pehuenia, along Rts 23, 11 and 13).

For more information:
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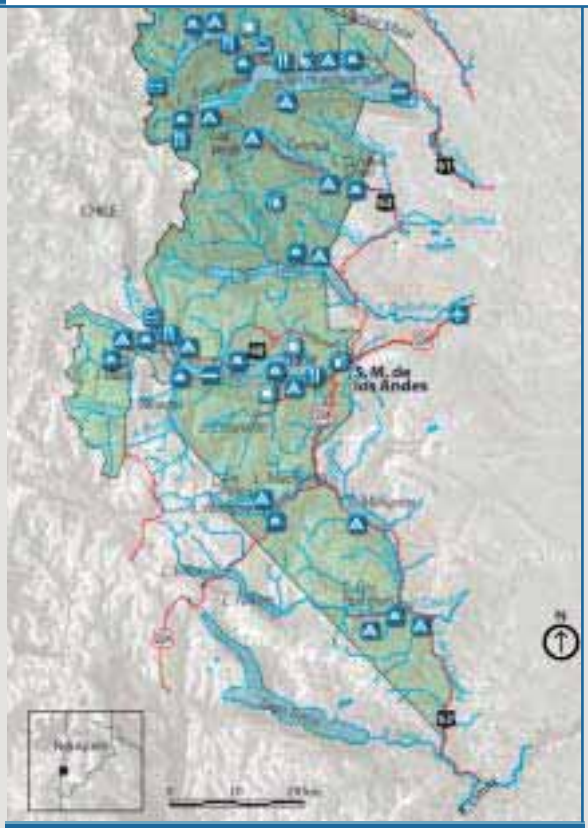
e-mails: servicioslanin@apn.gov.ar (tourist information) and info@parquenacionallanin.gov.ar (general enquiries).



Recreational Activities - South

The great temptation

From Lake Huechulafquen southwards, lies the largest concentration of tourisit and recreational alternatives of Lanin National Park. There are circuits, trails, and activities for all tastes. Even hunters are catered for although it may seem strange in a protected area.

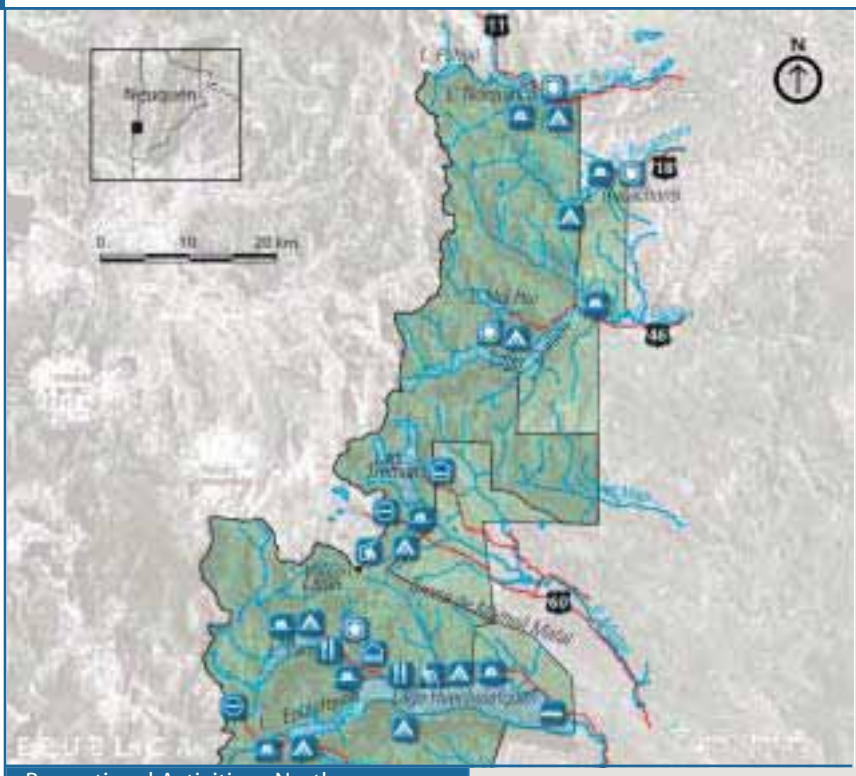
Lake Huechulafquen: 22 km from Junín de los Andes, along Rt 61, is the Herat of the largest watershed in the park. The north shore is preferred by backpackers. There are plenty of reasons for this. There are many camping areas (including one run by the Rakitwe and Lafkence Mapuche communities). It's ideal for pleasant walks and rides such as those to Paimun Lake, El Saltillo Waterfall and the Laguen-Co termal baths. And from here are the best views of Lanin volcano. From Puerto Canoas the catamaran excursion for lakes Huechulafquen and Epulafquen departs, to the lava flow that divides this last lake in two.

Big-game Hunting: The red deer and the European wild boar were introduced to the area before the park was created and cause severe damage to native flora and fauna. To control the spreading of these exotic species their hunting is permitted in fifteen different areas, along the lakes Lolog and Huechulafquen, and east of Tromen. the hunting season is March and April, to coincide with the rutting season of the red deer. The areas and periods are previously auctioned. According to those in the know, hunting in Lanin National Park is the most attractive hunting option in Argentina, as much for the scenic beauty as for the trophies to be obtained.

The lava-flow: : 450 years ago, a flow of red-hot lava divided one of the arms of Huechulafquen in two, thus creating Epulafquen ("two lakes" in Mapuche). Today, being hard rock, it can be climbed to its place of origin, the caldera of the volcano Achen Ñiyeu ("place that was hot").
The climb is not difficult, starts from the south shore of Laguna Verde and takes three hours. The descent requires just as much time, so take precautions as to timing (start before 2 pm). This lava-flow is 40 km from San Martin de lo Andes and is reached by Rt 62 via lakes Lolog, Curruhue Chico and Curruhue Grande. Eight kilometers further on the Lahuen-Co thermal baths offer a restorative dip.

Lake Lácar: At the western end is San Martín de los Andes where Park HQ are found and the main tourist centre of Neuquen. From here the launch excursions depart for Quila Quina and Hua Hum on the Chilean border. There are also roads along the north and south of the lake to reach dreamed-of places. And the famous "seven-lakes route" (Siete Lagos) which heads towards Bariloche through wonderful scenery. The area of Lacar also offers hikes such as the trail to Chachin waterfall or to Lake Escondido.

Lanin
National Park



Recreational Activities - North

The kingdom of the Araucarias

Between lakes Ñorquinco and Tromen, is part of the ancient Pehuen Mapu (Land of the Pehuen - Araucaria). It offers landscapes of hypnotic characteristics, some of the best fishing in the world, hikes that are full of charm, an enriching intercourse with Mapuche culture and for the more daring, the chance to view the world from 3776 metres elevation on the top of Lanin.

Lake Ñorquinco: 55 Km from Alumine, along Rt11, is the northern limit of the park. Its waters are surrounded by slopes cloaked in Araucarias and the three species of south-

Scattered by their military defeat the Mapuches, meaning "People of the Land", suffered confinement, persecution and disintegrating pressures. However, they were able to rebuild themselves under their ancestral identity for the struggle to have their rights restored and a fitting place in Argentine society. This initiative, backed also by other communities, bore fruit in 1994 under the new Constitution (Art. 65 – Inc.17) where the "ethnic and cultural preexistence of the indigenous tribes of the country" was recognized, opening the way for the return of their tribal lands and full participation in the management of the resources therein.

ern beeches some turning glorious colours with the onset of autumn. From the Park Ranger's house a trail leads to the Seccional cascade and 5 Km further on, to imposing Coloco waterfall. Another trail joins lakes Ñorquinco, Rucachoroi and Quillen, through wonderful landscapes. This takes three days to cover and requires permission from the Park Ranger. Do not miss the chance to meet the Ñorquinko Mapuche community where they run a camping-ground on the Pulmari river, 500m from the lake, and where handicrafts are sold.

Lake Rucachoroi: 26 Km from Alumine, along Rt18. At the eastern end of the lake, in the land of the Aigo Mapuche Community, one of the most ancient Araucaria woods prospers. One can visit Laguna Verde, a picturesque body of water, along a short trail, but with steep stretches. The Mapuche knitters and weavers in that place are among the best in the province.

Lake Quillen: 56 Km from Alumine, along Rts 23 and 46, this lake has gravel shores and delightfully peaceful landscapes. Further along there are splendid views of Lanin and of tiny lake Hui Hui. For trekkers there are the trails to Añihuaraqui – on the west shore of lake Quillen - and to the Arroyo Malalco valley, in the territory of the Lefiman Mapuche Community. In the camping area at Quillen, the Lefiman offer guided horse-back excursions, roast kid and other regional products.

Lake Tromen: 60 km from Junin de los Andes, along Rts 234 and 60, there are beaches of black volcanic sand and woods of the Aracaria trees, excellent fishing and the tempting proximity of Lanin volcano.

From the Ranger's house an easy trail three kilometres long takes one to the foot of the north wall. Up from there is the easiest and safest ascent to the top, with three refuges along the way. The climb requires physical fitness, adequate equipment and at least three days of strenuous effort. Few places give such a view, taking in four Argentine lakes and four Chilean volcanoes.

Sport fishing: Between November and April, fishermen from all over the world meet in Junin de los Andes. Not surprising. Only a few kilometres away, in the national park are some of the best waters in the world for trout. For example the upper reaches of the Malleo river or, in the area of Huechulafquen lake, the famous mouth of the Chimehuin river. To fish these places one must obtain the corresponding permit in Park HQ or in any other authorized place. And, of course, respect the current regulations.

In Lanin National Park that encompasses the lands of nine Mapuche communities, the opportunity was made use of to overcome decades of conflict, by returning the communal lands in an unprecedented experiment of shared management (see p 181). An equally transforming experience awaits the park's visitor who now has the chance to get to know these "People of the Land" and identify with them. To recognize oneself as part of a blessedly heterogeneous country, of multiple ethnicity and pluri-cultural that neither began yesterday nor disembarked from colonists' ships. To discover that one is also an "indian".

Species of Value

The voice of the land

"We wish to share with you, from the heart of what is today called Lanin National Park, the wonderful process of togetherness and Inter-cultural growth of the Mapuche People and the National Parks Administration, within the framework of co-management.

"When we say wonderful it does not mean that the relationship is magical or easy to maintain. We are engaged in overcoming a century of intolerance and cultural incomprehension between two societies that share one territory. To create this framework we have placed in the middle of the conference table what the ***Wajmapu*** *(territory) in its infinite goodness gives us, so that we as ce (persons) guarantee its survival: the* ***ixofijmgen*** *(all life in this portion of the territory that is Lanin National Park), what environmental speak would call* ***biodiversity*** *and in the terms of neo-liberal free market are* ***Natural resources****.*

"Over these five years of experience we have begun to understand that conservation is not incompatible with cultural development. We begin to understand what is happening in other parts of the world: that the management practices of indigenous peoples, their innovations and methods, based on the prerogative of custom, have proved to be systems that guarantee the conservation of biodiversity."

(Coordinator of Mapuche Organizations of Neuquen)

The Araucaria *(Araucaria araucana)*

This imposing conifer with its columnar trunk and parasolled crown, can reach 50 metres in height and live for more than 1,300 years. It is considered a living fossil. It grew hereabouts before flowering plants evolved, and dinosaurs took over the world, and before South America split off from Australia and the Antarctic. Today this species grows only in the west of Neuquen province and neighbouring regions in Chile, where there are pure woods or mixed in with nothofagus..
For the Mapuches it is a sacred tree. This is not surprising as from time immemorial the nutritious seed (pinyons) constitute a basic element in the diet of these original people.
It is harvested at the end of February until the first snows for eating raw, toasted, added to stews, for making flour and "chafi" (an alcoholic beverage) and for use as trade goods.
They are also food for a few of the native animals – the mole-rat and the austral parakeet; the first renders the service of dispersing the seeds carried around for storage.
Its limited distribution, slow growth and low germination make it very vulnerable to human impact.

Buff-Necked Ibis
(Theristicus caudatus)

This is one of the more common and characteristic birds of Patagonia though it is also seen in other parts of the country. Its family includes the spoonbills and other ibis from the world over. It is notable for its colouration and size (57 cm), but also for its strident call like a tin trumpet staccato. It hunts on the ground, preferably damp grass and the edge of lakes and water-courses,

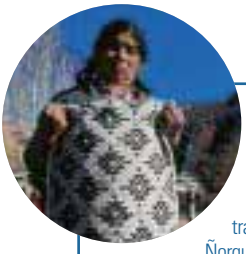
where it feeds on insects, worms, grubs, tadpoles and seed. It even takes frogs and toads. All of these are captured with the long, slender, probing bill, skewering the mud and roots of the vegetation. In mid-autumn numerous flocks migrate northwards to more clement climatic conditions. Months later they return and announce their arrival with the characteristic loud trumpetty honking to welcome the spring. They nest colonially on rocky outcrops, cliffs, reed-beds, even tree-tops.

The people of Lanin

Seven Mapuche communities give Lanin a unique flavour in the system of Argentina's protected areas. They number more than 2500 and occupy some 24,000 hectares, from the south of lake Lácar to the eastern end of lake Ñorquinco. They live in national and reserve areas, as well as Creoles live in private properties of housing, estancias and settlement, where productive practices compatible with the objectives of conservation are allowed.

The economy of the groups is around livestock and fire-wood. Some also provide tourist services, make and sell handicrafts (mostly weaves), cultivate vegetables for home consumption and in summer harvest the *Araucaria* pinyons.

In spite of decades of repression, their culture keep its strength. Under the volcano that "died choking" can still be heard *Mapudungun* – the language of the Mapuches -, the strings of tradition are still binding and the vertical looms still reproduce ancestral designs.



A new dawn

Two Mapuche communities in Lanin National Park have already received title deeds to their land - the Curruhuinca (10.500 hectares) and the Cayun (1.300), on the shores of lake Lácar. At present the process is under way for transferring the ancestral lands to the Rakitwe (Lake Huechulafquen) and the Ñorquinko (Lake Ñorquinco).

This has not been the only change of attitude in the National Parks Administration. Around sustainable development projects there has been progress in accord with the Mapuche Communities through Neuquen Mapuche Confederation, which has overcome decades of strife. This is an initiative with no precedents in the system of protected areas – co-management. Today, decisions on management of the lands in Mapuche territory in Lanin, are taken together and responsibility on environmental and social problems is shared. Former clashes have now given way to mutual understanding.

Los Alerces
National Park

On 11th May 1937, this national park was born, for the purpose of preserving our largest species of tree with the oldest specimens – the lahuan *(Fitzroya cupressoides)*, wrongly called "alerce" (larch). The main attraction in the 263,000 hectares is the woods of this tree on the north arm of Lago Menendez, one of the few woods of great age on the planet. Monarch of these woods is the specimen known as the Millennium tree, some 60 metres tall with a diameter of 2.2 m; it is some 2600 years old; within its lifetime Greek civilization spread through the Mediterranean and man set foot on the moon. It has even been witness to the genetic revolution, but has many expectations yet – lahuan trees live for around four thousand years.

Every morning from November to April, lake excursions depart from Villa Futalaufquen, the park administrative center, for the lahuan woods. After cruising on the Futalaufquen lake the boat ascends the Arrayanes river to a small jetty on beautiful Lago Verde. Passengers disembark here for a short walk over to Puerto Chucao, on Lago Menendez, where another launch awaits. Cruising is resumed on this second lake. Before arrival at the north arm, the gentle outline of Isla Grande and the stunning views of the Torrecillas glacier can be seen. Docking and the trail through the famous patch of woods follow. This last requires some two hours of walking. It starts off though an asphyxiating tunnel of colihue canes, then opens onto magnificent Lago Cisne and approaches the falls on the Cisne river. Lastly it reaches the woods of gigantic coihues *(N. dombeyi)* and lahuans where there is always a famous thousand year old specimen. The whole excursion lasts about nine hours but this time can be cut by half by reaching Puerto Canoas overland over the foot-bridge that crosses the Arrayanes river.

The excursion to the ancient lahuan woods is far from being the only recreational activity the park has to offer. Far from massive tourism, places such as Cerro La Torta or Froilan lagoon, Naufragio de Frei or Cerro Alto El Petizo, Stange river or the Monstruos narrows offer the meaningful adventures of climbing some mountain, riding along a rosary of lakes, shooting rapids in a kayak, fishing for trout on rivers where one is the only person trying one's luck, exploring where nobody seems to have trodden before.

This is considered the most vir-

Rivadavia lake. *Left:* Verde lake. *Top left corner:* Alstroemeria in flower. *Top left:* Huemul Andean deer. *Top right:* Thousand-year-old Lahuan.

Los Alerces
National Park

gin of the national parks in the north of Patagonia and is a special place for such immersions in nature. Even "civilized" Villa Futalaufquen offers good possibilities: from there start trails to Los Pumas stream, Tio Mindo waterfall, Cinco Saltos, a rock-face covered with rock paintings, and for those who do not shun a climb, the peak of Cerro Alto El Dedal (nearly 2000m). Not far off is the head of the trail that leads to the Krügger (sic) mountain refuge and its camping area, the shores of the Frey river - an ideal stretch for canoeists - the idyllic Las Palanganas area, and finally lake Amutui Quimei, a lake formed by the construction of the Futaleufu hydro-electric dam. In the shade of the lahuans one can find paradise on Earth.

The recreational importance of the park reflects the ecological variety. In the park is our largest and best kept sample of the Valdivian rainforest, the dampest and most bio-diverse of the Patagonian Andes forests and one of the 25 eco-regions of greatest significance for the conservation of the biodiversity of the planet. Here are found the southernmost stands of the lahuan, the coligüe cane, the arrayan myrtle, the austral cypress and the evergreen southern beech – coihue *(Nothofagus dombeyi)*. Amongst the 202 species of vertebrates figures the pudu – tiniest of deer, and a frog that is endemic to lake Menendez *(Batrachyla fitzroya)*, rare species such as the huiña cat and the tiny marsupial *Dromiciops gliroides*. There are also a handful of threatened and endangered species headed by the Chilean pigeon and the huemul Andean deer. Undoubtedly this is a valuable genetic bank.

Useful Data

Los Alerces National Park

The park was created on 11th May, 1937 by national decree Nº 105,433 (ratified later by Law Nº 13,895), and occupies the Patagonian Andes forests eco-region over an area of 259,570 hectares. The name is taken from the misnamed "Alerce" (larch), properly "lahuan"- our equivalent of the red-wood - which was the reason the area was made a national park. Points of interest include the thousands of year old stands of lahuan, lakes Rivadavia, Verde (with view-point), Cerro Alto El Petizo, Arrayanes river, Escondida lagoon, Villa Futalaufquen (park HQ), the rock paintings, Irigoyen and Tio Mindo waterfalls, Cerro Alto El Dedal, Cinco Saltos (five cascades), lake Krügger, Playa del Frances huemul observatory, the Futaleufu hydro-electric complex. To get to the park from nearby Esquel, in Chubut province, take Rts 259 and 71 westward to Villa Futalaufquen (park HQ – 52 Km). From Esquel to the southern part of the park, take Rt 259 to Trevelin and the road that leads to the Futaleufu HE complex (45 Km). From El Bolson in neighbouring Rio Negro province one can arrive at the northern entrance to the park along Rts 258 and 71 (105 Km). Esquel has three flights per week from Buenos Aires (Mon. Wed. Fri) and busses (with connections) from all corners of the country. From Esquel use rented car, pick-up or taxi, or the services of a tour agency. There is a daily bus service that calls at Villa Futalaufquen and points of interest along Rt 71. An entrance fee is charged (discounts for local tourism, residents of the province, university students; free for pensioners and children under 14).

For lodging, feeding and fuel, the park has five concessioned camp-grounds, three free camp-grounds and twelve open camping areas. There are six lots of cabins for renting, five hostels and a shelter. Eight restaurants, two stores and three kiosks. There is a service station in Villa Futalaufquen. Esquel, 36 Km away, and Trevelin (23 Km) have all manner of tourist services. The climate is cool temperate; average summer temperature in the low parts of the park is 14ºC (maximum over 30) while in winter the average temperature is 2ºC with some hard frosts. Between 800mm (east) and 3000mm (west) annual precipitation, mostly in winter. Snow in the colder months. The best time to visit is from the end of spring to early autumn. Nearby attractions include the Trochita narrow-gauge Patagonian "express" stream-train from Esquel. La Hoya winter sports facility, 13 Km from town with excellent snow conditions well into October. Trevelin (25 Km) is a living testimony of Welsh colonists, tea-houses, eisteddfods and all – Nant Facht Museum (a recycled mill), and the Nant and Fall waterfalls. By Rosario lagoon (25 Km from Trevelin) Mapuche weavers offer their wonderful articles for sale.

For further information contact:
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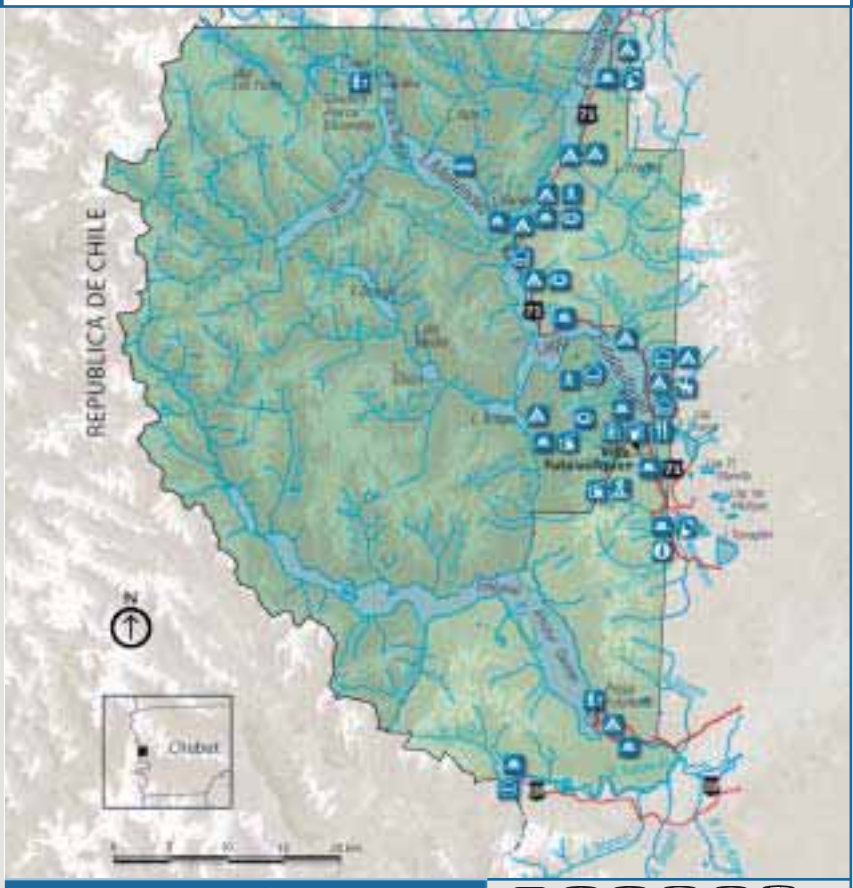
(9201) Villa Futalaufquen, Provincia del Chubut,
Tel (02945) 471015, Fax (02945) 471020,
e-mail: losalerces@apn.gov.ar.



Recreational Activities

Hiking and Trekking

There are many alternatives for exploring the park on foot. Some are open and free to all, others require registration for security reasons.

In the Lago Verde Ranger Station those who wish to attempt climbing the Cerro Alto El Petizo (6 hours - medium difficult) must put their name down. Ditto in the Arrayanes Ranger Station for those seeking to reach Laguna Escondida (3 hours - medium difficulty). At the Information desk in Villa Futalaufquen the same is true for those who wish to reach Arroyo Los Pumas (3 hours - medium difficulty), climb Cerro Alto El Dedal (7 hours, tough going) or walk from Puerto Limonao to splendid Lake Krügger (12 hours of hard going) where there is a camp site.

Los Alerces
National Park

Species of Value

The Lahuan, Alias Alerce
(Fitzroya cupressoides)

This species cannot disclaim its close relationship with the giant red-woods of California. However, it only shares a name with the "alerce" species in Europe – the larch. It is probably the tallest tree in South America, reaching 70 metres in height, and is undoubtedly the longest living. In Chile, one living specimen has been recorded that is 3622 years old, the second oldest tree in the world after a pinyon pine in the SW USA. The species only grows in the cool temperate forests of southern Chile and Argentina, and at an inordinately slow pace – one or two millimetres are added to its diameter each year.
This makes it a non-renewable natural resource, at least on our human time-scale. For decades it was irresponsibly felled for its timber used for posts, beams, furniture, shingles, boat-building, barrels, and even musical instruments. Such abuse was on the point of extirpating this Methuselahnic species from the face of the Earth but today the Mapuches' lahuan enjoys legal protection on both sides of the Andes range and its international commerce is forbidden. However, the threats from forest fires and from climate change still will not let it return to its thousand-year siesta in peace.

No Ill Will

The lake behindlthe Futaleufu HE dam is called Amutui Quimei (lost or vanished beauty in Mapuche). This was no whimsical baptism. Flooding took place in the 1970s and converted the lakes Situación Uno, Dos and Tres and the fantastic rapids between them into a single body of water, with no beaches, monotonous and unsuitable for boating.

Los Alerces National Park thereby sacrificed one of its most lovely landscapes. It seems a paradox that on the forest – dispenser of rainfall – the very provision of water depends as does the life of the dam itself. And so does the energy that the strategic aluminium works in Puerto Madryn uses, and that of several Chubut localities (2.560.000.000 kw per year). Such benefit does not appear to be recognized on the balance-sheets of the industrial complex nor of the province. To cap it all, the very integrity of the park is again in danger, from a gold-mining project that may well pollute the waters of Esquel with cyanide.

The Chucao Tapaculo *(Scelorchilus rubecula)*

In the bird-guides it is always referred to as "heard more than seen" which is easily understood. This typical denizen of the underbrush of the Valdivian forests is easy to locate but extremely difficult to see. It keeps to the dense and dark parts of the woods, even in the thickest cane-brakes. The much-heard chuckled call is clearly heard. The best way to see the bird is to remain motionless till its natural curiosity brings it into view on a furtive pass. Tail erect (its name refers to this: tapa – cover; culo – posterior), pretending to be uninterested in the intruder, it will soon sport for a few seconds only centimetres from the frozen bird-watcher, promptly to fade away into invisibility again.
Like the smaller magellanic tapaculo and the related gallitos, it is a ground bird, fast moving, that builds a nest low in the vegetation or a bank The female lays up to three white disproportionately large eggs. Nestlings hatch in summer and demand a constant supply of insects and other invertebrates from their parents. They are soon lifting their tail to look like their elders.

Memories of yesterday

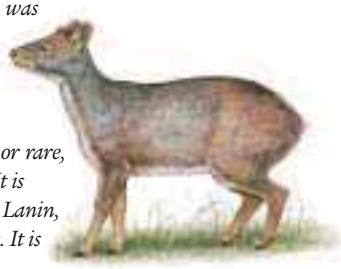
History has left tracks on the region occupied today by Los Alerces National Park. Its first inhabitants installed themselves here some 3000 years ago in the Desaguadero river valley, near Villa Futalaufquen. It is to these hunter-gatherers that we owe the abstract and schematic anthropomorphic motifs that people the wall of the Alero del Shaman that is visited on the Pinturas Rupestres Trail.

As from the XVIIIth century the Tehuelches, descendants of those first people, began to have racial and cultural intercourse with the Mapuches on the other side of the mountains. From this process of "Araucanization" there yet survive families of Mapuches in localities bordering the park, such as Nahuel Pan or Lago Rosario.

The "Desert Campaign" to drive the indians back (1879-1883), disarticulated those original peoples and provoked their abandoning of the ancestral lands. In the region of Futalaufquen, at the beginning of the XXth century, this vacuum was filled by colonists from Chile. Their surnames survive in the place-names; their houses built with "alerce" shingles still stand, and their descendants still work the soil as they did before.

Pudú *(Pudu puda)*

Abbot Molina, who discovered the species, believed that it was a forest goat. But it is a true deer, albeit the smallest in the world, with its cousin from the Andean forests of Colombia, Ecuador and Perú. It weighs under ten kilos and is a maximum of 42 cms tall. It lives in the Patagonian Andes in Chile and Argentina from Neuquen province to Santa Cruz. Threatened by man's incursions with cattle and dogs, it became shy and retiring, seeking safety in the densest undergrowth till it became "invisible" to the point that around the mid-70s it was thought to be seriously in danger of extinction. Concern even generated a captive breeding programme on Isla Victoria in Nahuel Huapi National Park At present it is believed to be an under-observed species rather than being threatened or rare, though it still figures on the red lists as "vulnerable". It is protected and present in many national parks - Lanin, Nahuel Huapi, Lago Puelo and especially Los Alerces. It is no coincidence that it figures on the park's badge.



Perito Moreno
National Park

Two eco-regions share the 126,830 hectares of this national park. The Patagonian steppe covers the eastern part with scrub and grassland on an elevated rolling plain at 900 metres above sea-level, dotted with a constellation of ponds where ducks, swans, sheld-geese and flamingos dwell, all amongst pastel-coloured hills. The South Andean Woods in turn climb the lower slopes of the mountains to a height of 1200 metres. Great snowy peaks lord it above the tree-line - rock-strewn with a few heroic ground-hugging plants. At the foot of the slopes, retreating glaciers left eight wild lakes, hypnotic turquoise, emerald green and grey, unsullied by any form of navigation. Lake Burmeister in its valley where devilish winds reign supreme, is the only one that drains to the Atlantic along the meandering Robles river. The waters of all the rest join forces to cut through to the Pacific and on the way create such spectacular places and landscapes as the Volcan river narrows and waterfall that lie between lakes Belgrano and Azara.

The waters of Perito Moreno National Park are the only ones in the whole of Andean Patagonia

Guanacos by Belgrano lake. *Top left corner:* Female Upland Goose. *Top:* Lake Burmeister.

that have not been subjected to the introduction of exotic trout. This means that the puyen, peladillas and other native fish live without the trout's predation and competition for resources, factors that have eliminated these native species from the rest of the region. The park also offers protection to other endangered wildlife such as the huemul Andean deer - the emblematic species - the hooded grebe, endemic to Santa Cruz province, and the orange mountain viscacha, also endemic to the province. The list of species of special interest and value includes the guanaco - here very abundant and extremely tame - the southern form of the lesser rhea, the Andean condor, torrent duck, white-throated caracara, Magellanic plover and Nansen's frog. Together with this array of stars there live the usual denizens of Patagonia's steppe and woods: pumas, güiña and pampas cats, foxes, skunks, pichi armadillos, and some 160 winged species that include the Magellanic horned-owl, and the imposing black-chested buzzard-eagle.

This prodigious life, together with a none less generous provision of fire-wood, water, shelters and stone for making tools, attracted man to the site at an early date. According to archaeological evidence the first arrivals were some 10,000 years before the present, and from that date till after the Spanish conquest - during the entire Holocene - the park was the territory of hunter-gatherers. At first they lived in the few natural rock shelters such as the one at Cerro Casa de Piedra since most of the area was covered by a huge lake (the watershed of lakes Belgrano and Burmeister). As the waters went down some 2500 years ago they exchanged their rock shelters for encampments and occupied the recently available lands. All evidence of their passage is lost at the time-period of two centuries ago, probably for two reasons: the brief mini-ice-age and the change brought about in their life-style and mobility by the availability of horses.

Perito Moreno

National Park

It is known that in the XIXth century the Tehuelches had no memories of the region that had been home to their ancestors for so long. This may explain why Musters, Lista and Moyano, all in contact with the Indians, are unaware of the existence of the area in spite of having been very close to it. The honour of its "discovery" and the initial naming of the features fell to the international border commission that settled our frontier with neighbouring Chile at the dawn of the XXth century. For example the first description of lake Belgrano was under the pen of the Italian ethnographer and naturalist Clemente Onelli who was the nexus between the commission in the field and the English arbitrator. "I saw it in the depths of the valley, blue as Kiraz turquoise and surrounded by black mountain cliffs" wrote the many-gifted count in his Trepando Los Andes (Climbing the Andes). The Swedish expedition to Patagonia was equally impressed by lakes Azara and Nansen. "I challenge anyone to show me a more varied and grandiose mountain landscape" wrote their chronicler.

More impressed by the grazing, fire-wood and water, settlers were not slow to arrive. Over time a handful of estancias managed to become established in spite of the Siberian climate and the solitude. Sheep took the land from the Tehuelches' "rou" (guanaco), but the national government had other plans and on 11th May 1937 the land of the turquoise lakes became a national park.

Useful Data

Perito Moreno National Park

The park came into being on 11th May 1937 by National Decree Nº 105.433 (ratified by National Law Nº 13,895), and includes samples of the high Patagonian Steppe, Patagonian Andes Woods and High Andes over an area of 126,830 hectares. The name is in honour of Francisco P. Moreno who is considered the father of our national parks. Places of interest are the Mie lagoons, Burmeister lake, Roble lagoon, Lago Belgrano waterfall, Azara lake, Belgrano peninsula, La Oriental estancia, Cerro Leon, Volcan lake, Volcan river narrows, Ricon valley. The nearest localities are Gobernador Gregores (220 Km SE) and Perito Moreno township (320 Km N). Gregores has a bus service from Rio Gallegos (that is connected by flights to Buenos Aires), and others from Puerto San Julian and from Cdte Luis Piedrabuena (these both receive busses, or connections, from all over the country). From there only chauffer-driven cars (remis) are available to reach the park. There is no entry fee charged. For lodging, food and fuel, the park has a camping area at the eastern end of Lake Burmeister - with bathrooms -, free camping at El Rincon and a temporary camping area by the reception and information centre. Two estancias welcome guests; Menelik on the entrance road, offers very comfortable rooms, local typical food, horse riding and first rate attention (information and reservations by telephone: 011-53715580 and 06751-051130), or e-mail: info@cielospatagonicos.com). And Estancia La Oriental on Belgrano lake, a humbler hostel, offering hiking and horse-back excursions, a camp-site and home-cooking (011-52374043 or info@estanciasdesantacruz.com). In the township of Perito Moreno (320 Km away) and Gobernador Gregores (220 Km) there are camp-grounds, hostels, restaurants, stores and service stations. Coming from the north the last place for petrol is Bajo Caracoles (165 km, on Rt 40). And from the south, Gobernador Gregores. It is wise to take food and extra fuel as well as two spare tyres. The climate is cold and dry (east) or humid (west). From E to W the rainfall increases from 300 to 3000 mm per year. The strong, constant and freezing westerly winds are famous. In winter the temperature drops to- 25ºC and in summer the average is around 15. However, never trust the weather - it can snow even at the height of summer. Be prepared. The best time to visit is between late spring and early autumn. Nearby attractions are Cueva de las Manos (218 Km from the park, N along Rts 37, 40 and 97). This is a National Historic Monument (1993) and a World Cultural Heritage Site (1999). Apart from the exceptional aesthetic value of the frescos, one can also become engrossed in the spiritual universe of those first Argentines who, over 12,000 years ago, conquered the Uttermost Parts of the Earth.

For further information:
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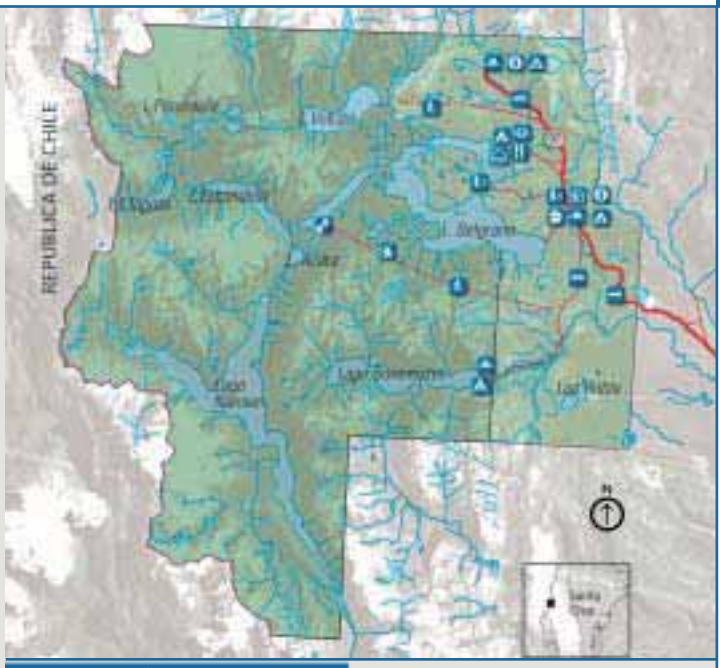

Recreational Activities

Hikes

For visitors' security and conservation purposes all visitors must register at the Reception Area on entering the park and inform rangers of their planned activities and places they wish to visit. These formalities over, the best and most varied assortment of recreational activities is available for enjoyment. To the south a road leads to the Mie lagoons (6 Km) where thousands of birds are to be observed, and on to the eastern end of Lake Burmeister (16 Km) with the lenga *(Nothofagus pumilio)* woods and troubled waters. Another road heads NW to the isthmus that leads on to the Belgrano Peninsula (10 Km). Northwards one can reach Estancia La Oriental (8 Km), the area of Lake Volcan (23 Km) and El Rincon (12 Km).

These are but the starting point for adventurous hikers and lovers of nature. The savage shores of Burmeister invite one to explore them. From Mie lagoons one can visit the Robles lagoon (10 Km easy walking), one of the places where the rare hooded grebe has been recorded, or the waterfall by which Lake Belgrano tumbles into Azara (25 Km of easy walking), overnighting at Puesto del 9, an old shepherds cabin. An interpretive trail 10 Km long explores Belgrano peninsula following guanaco tracks (1 to 2 hours of easy walking). A two-hour walk from the homestead of La Oriental estancia gets one to the top of Cerro Leon for magnificent views and close encounters with Andean condors (9 Km of fairly easy walking and a climb; the estancia organizes horse rides to the place). It is worth one's while to cover 5 Km to see the Volcan river narrows with the dizzying cliffs and the head of this lake - Volcan (fairly easy). And the Rincon valley, on the way to Mount San Lorenzo, at 3706 metres, the highest (and most beautiful) peak in Patagonia, bears evidence of the heroic efforts to settle the area. One must remember that there are no fires allowed in the camping area of Burmeister lake (in the others a camping stove is permitted) and all rubbish generated must be carried out.

The opportunities for nature watching or photography are great and varied. On the Mie lagoons sheld-geese, flamingos, great grebes, black-necked swans and flying steamer-ducks congregate. Condors glide by on stiff wings but a few feet over the top of Cerro Leon. And the guanacos on Belgrano peninsula are extremely tame, permitting close and intimate observation of their behaviour. Only the Torres del Paine National Park in Chile has anything to compare with this.

Guanacos

Perito Moreno
National Park

Species of Value

Lenga Southern Beech
(Nothofagus pumilio)

*This is the tree with the widest distribution in the Patagonian Andes woods extending from Neuquen province to the Beagle Channel and Staten Island (Isla de los Estados). In low, sheltered places it grows to more than thirty metres with a trunk diameter of up to 1.5 metres. But at elevation and at tree-line it is a stunted and gnarled shrub to support the heavy snow and ferocious winds. Its specific name (**pumilio** = small) alludes to this last bonsái version.*
In mid-autumn, before dropping its leaves, the colours of this southern beech turn the slopes red and gold, one of the most wonderful spectacles in Patagonia,

The past is present

The ten thousand years of human presence in the area of the park have left abundant traces. Just the cultural vestiges: pioneer estancia homesteads, cabins built with nothing but an axe such as the Brunel shack which bears the stamp of a mythical bandit, the shelters of early settlers and Indians, a stone tool "workshop", ten sites with rock paintings. The most important examples of these cover the walls of shelters and caves that honeycomb the north-facing slope of Cerro Casa de Piedra. Stencilled hands, guanacos and abstract motifs illustrate the spiritual world of the first people in Perito Moreno National Park These images are today off limits for visitors, and there are important reasons why. Not long ago Casa de Piedra was sacked by grave-robbers and the National Parks Administration decided to ban access to these sites till a valid impact of tourism evaluation is done for the site and proper controls brought into force that guarantee their conservation. Just behind the reception area, as compensation, an interpretive trail leads past a shelter with pictographs and over 6000 years of history.

The Andean Huemul Deer
(Hippocamelus bisulcus)

*This species foxed the early naturalists. At the end of the XVIIIth century, based on the reports of English sailors, Abbot Juan Ignacio Molina named it **Equus bisulcus** (horse with split hooves). Later, with time and comparing materials, its scientific name changed some thirty times.*
*In the end the label **Hippocamelus** (horse/camel) stuck. However the güemul of the Araucanians, or shoam of the Tehuelches, is nothing but a deer. It is stocky and dumpy - unlike most other deer that are graceful - features evolved in answer to demands of adapting to the mountain habitat that the lack of mountain goats in South America allowed it to occupy.*
It lives in the Patagonian woods on both sides of the Andes from Neuquen to Santa Cruz provinces.
It is considered an endangered species (in our country there may be but 600 alive). In 1996 - together with its cousin the taruca or northern andean deer - it was declared a National Natural Monument in its own right.
It is also protected in the Lanin, Nahuel Huapi, Lago Puelo, Los Alerces, Perito Moreno and Los Glaciares National Parks.

The Hooded Grebe
(Podiceps gallardoi)

With its piebald plumage and not inconsiderable size (35 cm long), it is amazing that this species was not discovered till 1974 by Maurice Rumboll who has a hand in this guide, on Laguna Los Escarchados right by old Rt 40 and not far from El Calafate. Its specific name is in honour of Jose Maria Gallardo a great scientist and naturalist. The hooded grebe is endemic to the Province of Santa Cruz. It winters on the Atlantic coastal waters and estuaries, and the rest of the year on some 130 ponds and small lakes on the plateaus at the foot of the mountains, where the water is transparent and there is a dense mat of aquatic vegetation. The weed is the habitat for a small snail and other small organisms that are the food for the species, and it provides the material for the floating nest where two eggs are aid. However only one chick ever makes it. Courtship is one of the most spectacular in the animal kingdom. At an amazing speed pairs dance and skim over the water in perfect coordinated movements, just to tie the knot. This reproduction has not been able to save the species from the endangered list. There are counts of not more than 3 to 5 thousand birds in all. The reason is the inland invasion of kelp gulls on carrion and rubbish; it steals the eggs, and one pair of these gulls has been known to destroy a whole nesting colony. Further, chicks are likely preyed upon by the introduced trout. Perito Moreno is the only park where this species has been recorded, and fortunately is free of these scourges.

Return to life

Perito Moreno National Park is decidedly more wild than the other Patagonian parks in the mountains. This is due mainly to the difficulties of reaching the area that the severe climate was responsible for. Thus massive tourism and other "civilizing" influences have not reached it. The bad effect of this is that for years it was abandoned. From its creation till the 80s there were but occasional visits from National Parks' personnel in spite of the fact that there were four working estancias in the park.

The farmers were the cause of more than one headache for the Administration. The main one was the environmental and landscape degradation by overgrazing. By the early 90s there was a decision to stop this and a plan was implemented for the eradication of livestock. The amazing success of the project was due to factors outside Parks' control - the collapse of the international wool price and the eruption of the Hudson volcano that led to two sheep-farms being abandoned and convinced the other two that it was time to reconvert. La Oriental opted for tourist activities and Lago Belgrano estancia turned to less impacting animal husbandry - cattle and horses. And in 1993 sheep took their final leave of the area; only a few head remain for home consumption.

Nature was not slow to take advantage of the situation. In less than a decade the woods are recuperating lost ground, the bunch-grass is taller, valley bottoms are greener and there are more guanacos. The Belgrano Peninsula became more luxuriant - the home range of unusually tame and trusting herds of these animals, the eastern end of Lake Burmeister with its rough waters and "flag" trees, picturesque lagoons like the Mie, the desolate valley of the Lacteo river and other tourist spots. Perito Moreno is looking ever more like the thousand year old frescos on the walls of Casa de Piedra.

Los Glaciares
National Park

Ice dominates the landscape. One might almost think that it is alive - it advances and retreats, changes shapes, builds dams, sculpts the mountains, drops away to sail on the lakes at the whim of the winds. Reflected in the waters or outlined against the sky, glaciers provide an incomparable background especially when framed by woods and bare mountain summits. In 1981 Los Glaciares National Park joined the list of World Natural Heritage Sites of UNESCO because of the exceptional character and universal value conferred by the thirteen major rivers of ice that descend from the South Patagonian Ice-cap towards the Atlantic. "They are tangible evidence of the last two million years of history and are witnesses to the very birth of humanity" reads the plaque placed by UNESCO before the Moreno glacier.

Traces of the Quaternary glaciations are everywhere to be seen. The ice-sheet reached eastward to the middle of the Patagonian steppe and as it advanced it covered the whole of Los Glaciares National Park with a mantle of ice more than one kilometre thick, gouging deep U-shaped valleys that today are the sites of imposing lakes, Argentino and Roca in the south, Viedma in the north of the park.

Perito Moreno glacier. *Top left corner:* Magellanic Horned Owl. *Top left:* Upsala glacier. *Top right:* Onelli lake.

Ice still covers over half the area of the park and the world knows about it because of the Moreno glacier. Over thirty kilometres long, with a surface area larger than Buenos Aires city and a four kilometre front on the waters of Lago Argentino rising up to 70 metres above the waters. But its edge over others is given by its

Los Glaciares
National Park

Mount Fitzroy or Chalten

accessibility, being but an hour's drive from El Calafate, and above all, by the periodic spectacle of its frontal collapse that takes place every so often (see pp 200-201). Upsala, the glacier that descends into the northern arm of the same lake, is imposing in its size - 600 sq Km and 50 Km long, - the greatest on the Atlantic slope of the ice-cap, while the second is the Viedma glacier that descends into its namesake lake, only slightly smaller at 575 sq Km . Of the big three it is the only one not visited;. tour launches cruise the front of Upsala after wending their way through a mass of ice-bergs that make the boats look like Matchbox toys, while on the frigid surface of Moreno glacier one can even take a stroll.

However, not everything is ice and glaciers. In the park there are rock paintings and Lake Roca is tempting for fishermen. In the northern part of the park the attraction of ice cedes its first place to the granite. Accompanied by a court of lesser towers, Mount Fitzroy or Chalten (3375 m) lords it over the surrounding landscape with a hypnotic attraction. It is said that these are the most beautiful mountains in the world and it is easy to credit this claim.

Useful Data

Los Glaciares National Park

The park was created on 11th May, 1937, under national law Nº 13895. Three eco-regions are represented - Patagonian steppe, Sub-Antarctic woods and the High Andes. The area of the park is 726,927 hectares and its name refers to the thirteen glaciers that descend from the continental ice-cap towards the Atlantic, giving the park international acclaim. Points of interest are the Moreno, Upsala and Spegazzini glaciers, lake Roca, Onelli lagoon; the area around Mount Fitzroy or Chalten, and the South Patagonian Ice-cap. El Calafate is the base of operations for the park. There is an international airport that receives flights; busses arrive from Rio Gallegos. Tour operators have an array of offers or rental cars to visit the park. West along Rt 11 Moreno glacier awaits at 74 Km distance. Puerto Bandera is the embarking place for lake excursions (47 Km west along Rts 11 and 8). To reach Chalten, base of operations for the northern part of the park, Rt 11 east, Rt 40 northward and back toward the mountains along Rt. 23, a total of 220 Km. There is a daily bus service from El Calafate to Chalten. There is an entry fee to pay, with discounts for local tourism, residents of the province of Santa Cruz and university students. Free for pensioners and children under 14. Chalten and El Calafatre have all the tourist services. There are camping areas at Lago Roca (concessioned), eight areas for free camping (El Huala, Confluencia, Madsen, De Agostini, Poincenot, Laguna Capri, Toro and Río Blanco) and two picnic areas (day use only) at Bahia Escondida and Rio Mitre. On Magallanes peninsula, facing the Moreno glacier there is a five-star lodge and a tea-house. Several estancias are open to receive guests both within the protected area and in the surroundings. The climate is cool temperate and damp with average lowland temperatures of 0.6ºC in winter and 13.4 in summer (-3º is the average yearly temperature at higher elevations). Between 500mm (in the east) and 900mm (in the west) of precipitation fall each year, fairly evenly spread throughout the year. Snow is usual in colder months; winds stronger in summer. The best time to visit is between the end of spring and early autumn. Nearby attractions are the Laguna del Desierto (37 Km from Chalten along Rt 23) where camping and fishing are allowed among lovely ancient woods, with glaciers and streams.

For further information contact Park HQ at:
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Recreational Activities - North

Trekking capital:

Founded mainly for geo-political reasons, and sited at the foot of Mt. Fitzroy, (Chalten), within the bounds of Los Glaciares National Park, the township of El Chalten is today a tourist village where people from all over the world come. Climbers especially are drawn by the challenge of Fitzroy or Torre that are considered one of the world's greatest tests of mountaineers. It was declared the Nation's Trekking Capital and with very good reason: the surrounding natural landscape is a permanent invitation to hike. Here visitors are offered hikes of all degrees of difficulty and in varied lengths - a menu for all tastes.

The South Patagonian Ice-cap:

Trekking on the ice-cap is a demanding exercise that requires physical fitness, but no prior mountain experience is necessary. Obviously one is required to take a licensed guide. From Chalten one reaches the ice-cap via two main passes, Marconi and Paso del Viento. These outings can be varied to please the taste of participants. As well as the guides, the expert tour operators provide the camping equipment and food. The trek can take several days (at least six) and walking on the ice is done wearing crampons and harness, with ropes and ice-pick. The excursion provides an unlimited number of unforgettable landscapes, especially the Circo de los Altares crossing.

Torre Lagoon:

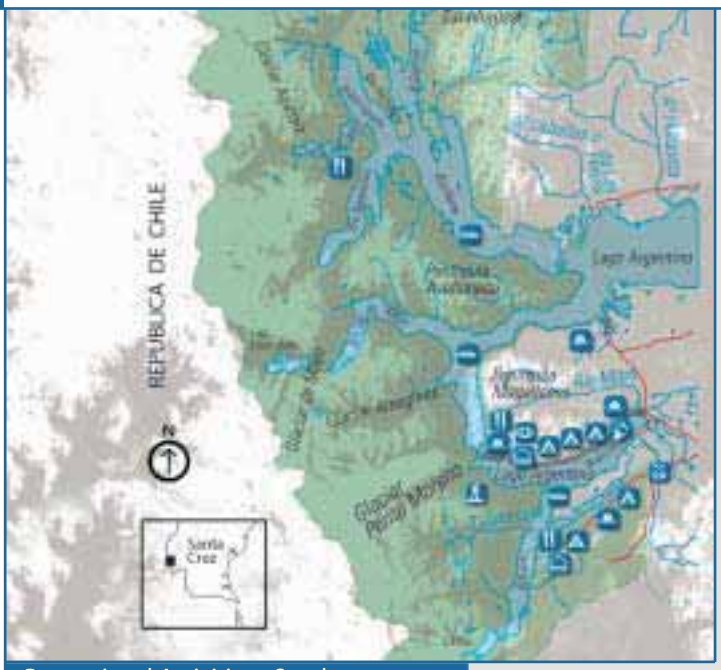
This is a gentle hike that follows the Fitzroy river valley for some four hours, as far as the Torre lagoon. The trail offers various panoramic views before reaching the Padre De Agostini camping area (there are no services, and it is one of the most popular amongst climbers - no fires are permitted). Eventually the lagoon shows its spectacular panorama with the Torre and Grande glaciers, the Adela range and imposing Cerro Torre itself, standing with the Egger, Standhart, Bifida and Cuatro Dedos towers.

Poincenot camping area and Los Tres lagoon:

This is a six-hour hike leaving Chalten in a northward direction, following the course of the Vueltas river till Mt Rosado is passed behind; here there is a panoramic view with spectacular sights of Mt. Fitzroy (Chalten). The track proceeds to the Chorrillos river and follows it up to the Poincenot encampment. From there one can cross the Blanco river and proceed uphill as far as Los Tres lagoon at the foot of Mt Fitzroy (Chalten). One possibility is to sleep overnight in Poincenot and start your climb before dawn - if there are no clouds, the reward is a view of the massive towers tinted red by the rising sun.

Los Glaciares

National Park



Recreational Activities - South

Trip to the ice

Those who are not satisfied with simply contemplating glaciers from well placed viewing points, have a varied selection of alternatives to get a closer experience of ice, some verging on adventure tourism.

Launch to Moreno Glacier:
A cruise on the Rico arm of Lago Argentino allows for a close look at the icebergs and the blue glacier snout, very impressive with its 80 metre height.

Walking on the Moreno glacier:
Taking in first a cruise on Rico arm of the lake, followed by a walk through the woods around the lake, and ending with a hike on the very Moreno glacier itself, with its séracs, towers, fissures and crevasses and the incredibly blue lake. The tour operators provide crampons to buckle

The difficult bit is getting to the top of any of them, protected as they are by severe storms, avalanches and ferocious winds. Every year climbers from the five continents attempt the ascents and return to the village of Chalten, a veritable mountaineer's Babel. Common mortals are left to "climb" these mountains with their eyes, and a great variety of hikes to delightful places such as Chorrillo del Salto, Laguna Torre, Río Blanco, Laguna Capri, Laguna de los Tres and Piedra del Fraile. Armed with the spirit of adventure and strong legs one can even attempt a trek on the very South Patagonian Ice-cap itself. Condors hanging on the wind, and the double drumming of the magellanic woodpecker lend spice to such outings. Occasionally a "red" fox or the emblematic huemul Andean

over your footwear and professional guides. It is not a demanding exercise - young and old all manage it - but it does require warm clothing, dark glasses, sun lotion, mittens or gloves, and a cap.

Cruising amongst icebergs:
There is the possibility of cruising for two days and a night on Lago Argentino, never disembarking, with full board and lodging with private bathroom. These cruises are for more than ten people and have all commodities. The experience of spending a Patagonian night amongst the ice and lakes is quite unique.

Cruise and a splash on Lago Roca:
south of Lago Argentino and 51 Km from Calafate, a cruise on lake Roca to visit the estancias and an archaeological site with rock paintings. In summer the more hardy visitors enjoy a dip in the cold waters of the lake.

Cruising on the North Arm of Lago Argentino:
Two catamarans sail each morning from Puerto Bandera (45 Km from Calafate) for a day excursion that returns at 6 pm. It is a fascinating cruise; outward bound they thread through the impressive icebergs and cruise the 7 Km along the face of the Upsala glacier (the largest on the Atlantic side of the Andes). When ice conditions permit a visit is paid to peaceful Onelli bay with a stroll overland to the Onelli lagoon where the Agassiz, Bolado and Onelli glaciers all converge. Here lunch is taken in a shelter amongst the trees. On the return trip there is yet a surprise - the Spegazzini glacier at the head of a narrow fjord, in the shadow of pyramid-shaped mount Peineta. In the middle, its snout rises 135 metres from the water - the highest that is accessible to visitors.

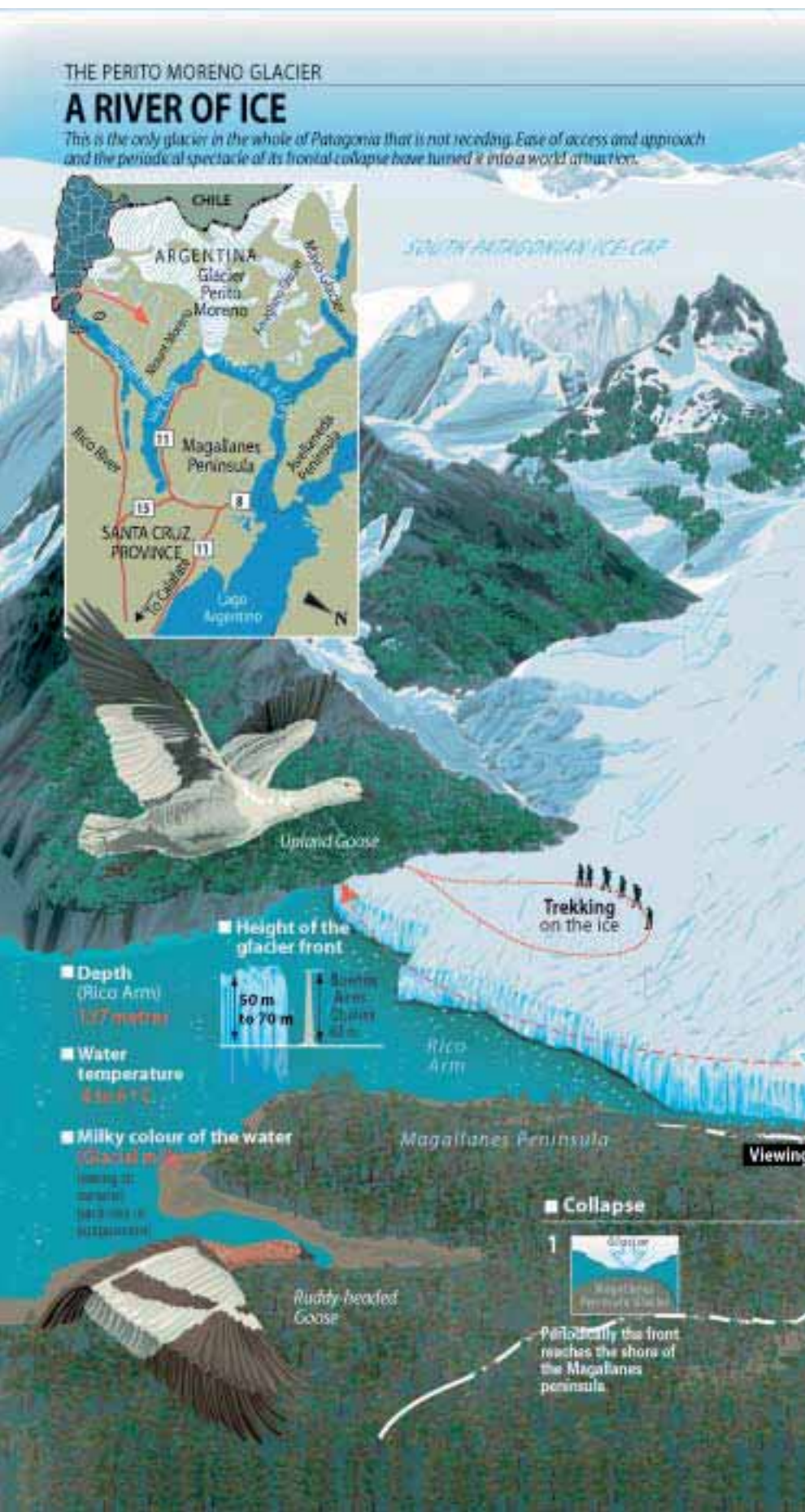
deer with a fair population surviving in this part of the park, dare show themselves.

The park shelters a further 26 species of native mammals and a list of birds with nearly 150 entries, from the yellow-bridled finch to the black-chested buzzard-eagle, or the Chilean pigeon to the torrent duck. The figure reflects the vide variety of habitats. From lake shores up mountain slopes grow magnificent woods of southern beeches *(Nothofagus spp)*; further east, as one leaves the mountains, it is the Chilean firebush and Berberis that dominate, till finally one emerges onto the open Patagonian steppe of wide horizons, prickly grasses and stunted bushes, frequented by lesser rheas and guanacos. All these landscapes are in themselves a vision to remember and cherish.

THE PERITO MORENO GLACIER

A RIVER OF ICE

This is the only glacier in the whole of Patagonia that is not receding. Ease of access and approach and the periodical spectacle of its frontal collapse have turned it into a world attraction.



■ Glaciers
Are masses of ice flowing downhill due to gravity.
Snowfalls accumulated over centuries and compact under its own weight to form ice.
Movement is due to the reduction of the ice by melting, evaporation or calving bergs at the front.
For a glacier to survive, yearly temperatures must keep low and snowfall must exceed melt, evaporation and loss to calving bergs.
Andean Condor
■ Superface area
250 sq.km
(City of Buenos Aires: 202 sq.km)
■ Length
30 km
GLACIER PERITO MORENO
■ Speed of flow
2,2 metres per day in the middle
0,35 metres per day on the sides
■ Front
4 km
This is the only Patagonian glacier that is in equilibrium (not receding nor advancing)
Experts believe that this phenomenon is due to topographic, hidden landscape forms and local climatic conditions.
■ Calving
From the front huge blocks break away to form icebergs that fall into Iceberg Alley.
ewing platforms
Walk-ways
Iceberg Alley
2
This forms an obstruction that dams up the waters of the Rico and Sur arms of the lake, causing them to rise more than de 20 metres.
3
The pressure of the water increases till the ice "dam" bursts.
4
The glacier front collapses into "Iceberg Alley".
This collapse happens at (varying) three or four year
The last time was on 13th March, 2006.
Before that it had been on 17th February, 1998.
The first time this phenomenon was recorded was in 1917.

Los Glaciares
National Park

The Ice-cap

The South Patagonian Ice-cap is 13,000 square kilometres in size and is shared between Argentina and Chile. It tops the southern Andes for 350 Km (48º20'S to 51º30'S) and is the most significant in the world after Antarctica and Greenland. The area in Argentina is some 3,500 sq. Km of which 2,600 are in Los Glaciares National Park.

From this mass of ice flow 13 great glaciers towards the watersheds of lakes Argentino and Viedma: from north to south they are Marconi, Viedma, Moyano, Upsala, Agassiz, Bolado, Onelli, Peineta, Spegazzini, Mayo, Ameghino, Moreno and Frías. There are also some 190 lesser glaciers in the area, none connected to the continental ice-cap. Most of these glaciers have retreated notably during the last half century while the Moreno glacier has undergone strong fluctuations.

Reason for protecting the area are many and varied. For one thing, neighbouring the ice-cap there are habitats of interesting diversity, biological importance under such conditions, and that have not been directly altered by man's actions. Another reason is that the study of the ice provides fundamental data for understanding global climate processes. And more yet: it is one of the most important reservoirs of fresh water on the continent, giving it a preponderant role in geo-political manoeuvres. This immense mass of ice replenishes a drainage system with potential for irrigation and hydro-electric production, two essential factors in the development of Patagonia.

Species of Value

The "Red" Fox
(Dusicyon culpaeus)

The Mapuches' name for it is culpeo or chulpeo. It is widely distributed along the Andes from Jujuy to Tierra del Fuego. It is frequent in Patagonia as is also its mention in myths and legends of the region. Up to 1.5 m long, it is the second largest canine on the South American continent after the maned wolf, and clothed in a thick pelt, long and with reddish tints. The very bushy tail ends in a black tip. It is a species of the edge of the woods, tall scrub, deserts and steppe as well as upland grassland. It is usually solitary except in the breeding season when male and female share the task of maintaining territory and feeding the litter of between three and eight cubs. In diet it is a typical fox in being an opportunist, but preys mainly on European hares, mice and the occasional sheep, while not refusing the chance at a dove, amphibian, lizard, a clutch of eggs. It even feeds on insects and when the season arrives, wild fruit.

Black-Chested Buzzard-Eagle
(Geranoaetus melanoleucus)

This is a most imposing bird of prey measuring up to 70 cm in length (females are larger than males), on a wingspan of some two metres. It is a master at soaring on extended wings and in flight, adults can easily be recognized by their triangular shape since the tail is extremely short. Head, breast upper wings and back are dark grey (darker on the chest). The rest of the underparts seem white but are in fact finely barred black. It is widely distributed through South America from Venezuela to Tierra del Fuego, and lives in woods, open areas, mountain slopes and cliffs, up to 4,500 metres elevation. It is large enough to take medium sized prey such as a hare, young fox or large skunk, though usually it sticks to smaller rodents, birds, some reptile, invertebrates and even carrion. It usually feeds on the ground, seldom does it take its victim to a tree for feeding.

The Calafate Berberis
(Berberis buxifolia)

It is said that anyone who eats the fruit of the calafate is bound to return to Patagonia. This is a spherical berry, blue-black in colour. The calafate is without a doubt one of the emblematic plants of this mythical region. The bush is some metre and a half tall and covered with pale triple thorns. The long roots reach underground water and thus allow the plant to survive the severe dryness of the habitat. The small leaves reduce loss of water through tran spiration. Calafate blossoms in spring, dangling clusters of yellow flowers; fruit is ripe from November till April. Its distribution is almost throughout Patagonia from Neuquen to Tierra del Fuego. It prefers the dampers areas on slopes, valleys and gorges, and near the shores of rivers and lakes. Sheep feed on its leaves and fruit and find shelter under its foliage. Jams and a Berberis wine are made from the fruit. The indigenous people used the wood for shafts for their arrows, to bring down a fever and for a yellow dye.

The Guanaco Hunters

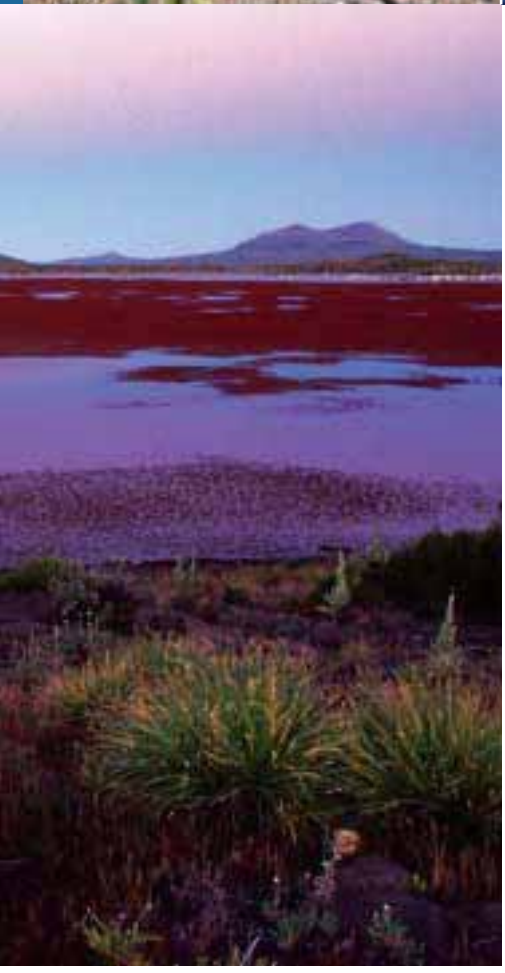
It is in Santa Cruz that the oldest record of human habitation for Argentina has been found (12,600 years before the present). However, dating archaeological remains around Lago Argentino has given dates of only around three thousand years. Man had to wait a long time for the ice to let him by.

The earliest people in what is today the national park were hunter-gatherers whose survival was dependant on the guanaco. They moved with the cycles from the steppe to the woods, reaching elevations above one thousand metres from sea-level, to use the resources available throughout the year in the different habitats of the region. They manufactured stone tools and dwelt in sheltering overhangs in rock-faces. Some of these places still sport their rock paintings that throw light on their spiritual world. Near Lago Roca, for example, a wall bears representations of men and animals being accompanied by enigmatic abstract figures. Amongst the remains of these cultures there are artefacts originating on the Pacific coast that implied direct communication with that region, or a network of commercial trading with other groups.

Laguna Blanca
National Park

This park was created in 1940 in order to protect an amazing population of black-necked swans (between 1500 and 2000 birds). At the same time it protects a fair sample of the Patagonian steppe and another 197 species of birds. This diversity of birds is not unimportant - Nahuel Huapi National Park, with a surface area 63 times greater, has only a slightly greater variety.

The area of this protected park is of 11,250 hectares. In the heart of the park, surrounded by ancient volcanic cones, rock piles and basalt ledges of sombre tones, lies the Blanca lake itself, fed by temporary streams of little volume. It is six kilometres long by four across and is ten metres deep. What is special about this lake is its generous production of micro-organisms and aquatic vegetation. It is this abundance of food that attracts and maintains the feathered hordes. For this reason it is considered the most important body of water for nesting birds in the whole of Patagonia. Since



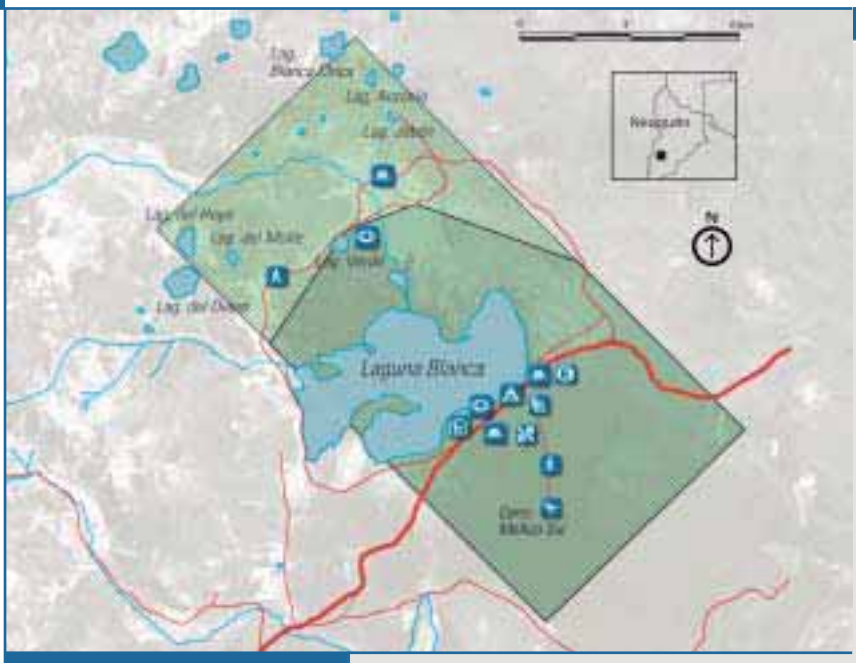
Laguna Blanca. *Top left corner:* Caterpillar. *Top left:* Patagonian Pichi Armadillo. *Top right:* Black-necked Swan.

1992 it has been included on the Ramsar convention's list of internationally important wetlands. It is also an important site for migratory species such as the endangered ruddy-headed goose and several shorebirds, as they use it as a strategic stop-over for recuperating reserves and resting. There is even an endemic species - the Patagonian aquatic frog *(Atelognathus patagonicus)* that is closely related to the species that amazed Jacques Cousteau under the waters of lake Titicaca. It also sports great folds of skin on its flanks that are the means of "breathing" without ever coming to the surface for the whole of its biological cycle.

The biological cycle of birds is under the sky, in the air. With the arrival of spring, the best time for a visit, the park comes alive. Thousands of moving specks and patches cover the waters of the lake and of the surrounding lesser bodies of water. A closer look will reveal that they are swans, grebes, coots, ducks and flamingos. on the stony shores one can see the first indications of the onset of nesting. Under the protection of a peninsula swans intertwine their necks in courtship and ruddy ducks perform their fevered display rituals. On the red carpet of floating vegetation, the multitudinous population of silvery grebes set up their breeding colony where pairs are formed, territories argued over, nesting materials filched from a neighbour; threats, chases and copulation. Further off, Chilean flamingos try out their coordinated movements of their complicated ritual "dance". Few places on earth allow for such close observation of bird behaviour. Laguna Blanca is a ethologists dream.

The spectacle on the lake steals the show from the habitat that starts on its very edge - the desolate vastness of the steppe. It is unfair. From the stunted tree *(Schinus polygamus)* to the

Laguna Blanca
National Park



Recreational Activities

Bird-watching

Laguna Blanca National Park is an irresistible temptation for anyone interested in birds. In its 11,250 hectares nearly 200 species of bird have been recorded. Further, one can study the nesting habits of swans, grebes, coots and flamingos and wonder at the amazing numbers. This is, after all, the most important lake for nesting birds in the whole of Patagonia.

There is a blind for the observation of birds on the Laguna Blanca itself but its position overlooks a sector of coast that is little used by birds. To see birds it is best to travel the trail that rounds the western end of the lake. Further on the track reaches Laguna Verde where there is another observatory and shorebirds and flamingos are numerous. Before indulging it is best to know some of the secrets of the region's nature by visiting the interpretive trail called "Abrigo de la Laguna" and the panels in the interpretive centre open daily from December to March; in winter only on weekends and public holidays.

The recreational offer in the park also include less contemplative activities such as climbing the Mellizo Sur mount - an ancient volcano - or a hike to the Llano Blanco plain. From 1st May till 30th September is the fishing season when one can try for large-mouthed perch, and brown or rainbow trout. You need a permit. These species were introduced illegally in the mid-60s and it seems that they are responsible for the disappearance of the endemic aquatic frog.

Useful Data

Laguna Blanca National Park

The park was created on 31st May, 1940 under national decree Nº 63691.

It is in the Patagonian steppe eco-region and covers an area of 11,250 hectares.

The name of the park is taken from its main body of water (1,700 hectares). Points of interest include the Visitors' Centre, the Abrigo de la Laguna nature trail, the bird observatories on Blanca and Verde lakes, Llano Blanco plains and mount Mellizo Sur. To reach the park, from Neuquen city take Rt 22 to Zapala, then Rt 40 southward and 46 west (215 Km). From Mendoza in the north, south along 40, then 46 west (984 Km). From Temuco (Chile) over the Icalma pass, then Rts 13 and 46 (287 Km). From Bariloche in the south, Rts 237, 40 and 46 (376 Km). Neuquen and Bariloche have daily flights, and in both there are rental cars and tour operators. There is a LADE flight to Zapala (also reached by busse) where taxis are available, or a daily bus service (departs 6pm) for Alumine, that goes through the park. In summer there are also minibus services.

There is no park entry fee charged. During warmer months the Visitors'Centre is open from 8 am to 8 pm. During winter's week-ends and public holidays it is open from 9 am till 6 pm. There is a picnic and free camping area in the park with tables and seats, shade. Drinking water is not available so take plenty with you. Lodging and restaurants, supermarkets and service stations are all available in Zapala (30 Km distant). The climate is dry and windy with great daily temperature variation. Average in summer 22ºC (maximumover 40), in winter 5ºC (minimum as low as -20ºC). 150 to 200mm of precipitation falls each year, mostly in winter- Considerable snow in the colder months. Strong dry (föhn) winds from the west. The best time for a visit is between November and March. Nearby attractions include Alumine lake (157Km to Villa Pehuenia), Lanin National Park (118 Km to Quillen, 125 to Rucachoroy and 155 to Ñorquinco), Copahue Provincial Park (194 Km to Villa Caviahue).

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bunches of *Stipa* grasses, the botanical species are performing admirable feats. To survive on the Patagonian steppe where the rainfall is less than 200 mm annually and winds are devilishly strong, plants have developed heroic strategies. Some grow as cushion plants barely rising from the ground, others have incredibly deep roots; yet others discourage grazing animals under a defence of sharp thorns while tiny leaves are a strategy to reduce water loss through transpiration to a minimum. Some plants live out their cycle during the favourable warmer months and survive the rigours of winter as seeds. On, under and by these heroic survivors of the steppe live some seventy species of birds -greatest amongst which is the lesser rhea -thirty kinds of mammals, twenty reptiles and among the mere handful of amphibians, another endemic- the basalt frog.

Amongst the resources of the steppe are the remains of past civilizations, vestiges of the original inhabitants (burial sites, stone tool workshops, rock art) and an important fossil deposit near Cerro Mellizo Sur, the highest point in the region with its 1721 metres elevation above sea level. Ammonites and other sea organisms of bygone eras are evidence that some 140 million years ago, this domain of the black-necked swan was covered by the ocean. Not far from this ancient cemetery the Mapuche families of the park and neighbouring areas proudly proclaim that their culture is still very much alive.

Bosques Petrificados

Natural Monument

The writer Osvaldo Bayer noted that to understand the moon or the distance to the stars was easier than understanding the massive stone columns before him, and he was right. One's mind is reluctant to connect these enormous tree-trunks with the luxuriant forests that they came from. It is hard to imagine how the swampy green landscape of yore with its clumsy great reptiles was transformed into the present parched and empty otherworldly surroundings where even life seems impossible.

The Bosque Petrificado Natural Monument was created on 5th May 1954 with the purpose of preserving 10,000 hectares with the fossil flora therein contained - the most extraordinary in the country and perhaps in the world. In 1984 the Agrarian Council of the province of Santa Cruz ceded a neighbouring five thousand hectares and thirteen years later the National Parks Administration purchased two adjacent sheep farms. With all these additions as well as a plot of two thousand fiscal hectares, the area protected became six times its original size to become a respectable sample of the Patagonian steppe; so it is not surprising that its promotion to the full status of national park is on the boards.

Just a few metres from the ranger's house the main fossil deposit (the "fascinating cemetery" in Bayer's words) is one of trunks up to three metres in diameter that were over a thousand years old when they passed from the vegetable kingdom into that of minerals. Some 150 million years ago (end of September if our yearly calendar can be used for comparing the geological history of our planet), these trees grew in a scattered conifer wood. The largest species was the *Araucaria* (*mirabilis*, to give it the proper scientific name), not unlike the species we can still admire growing in western Neuquen province. Judging from imprints left in the sedimentary rock, nearer the ground flourished other conifer relations, huge ferns and the palms of those times - benetitales (now extinct as a group) and cicads - all severely threatened today.

In those days the great wall of the Andes chain of mountains had not risen to the west and in its place was the sea. Patagonia enjoyed the stable and warm climate of the Jurassic period and no barrier stopped the humid airs bringing generous rains to the region where the arid steppes are today. To the east there was no wide Atlantic separation and we were joined to Africa.

Suddenly, towards the end of the mid-Jurassic period tectonic forces rent the land mass. Tremendous hurricane winds blew down the forests, the land was cloaked by a settling of volcanic ash that covered all. This all happened so suddenly that

Left: Standing petrified tree-trunks. *Top left corner:* Long-tailed Meadowlark. *Top:* Fossil Araucarias.

Bosques Petrificados
Natural Monument

not even the pine cones had time to open and release their promissory seed, a process that usually takes but a few days.

Under that volcanic sepulchre so rich in minerals a true miracle took place: silica salts, released from the ash by dilution in the water from rain sifting downward through the layers of ash, replaced the vegetable material so faithfully that the structure of each cell is observable under a microscope. Now stone, these woods waited under their mantle of rock for their exhumation by wind and rain.

First the Atlantic Ocean had to retreat - its waters covered the region during the first half of the Tertiary period; then the patient labour of unearthing by wind and rain, this in the rare torrential downpours that fall occasionally to make the 200 or so millimetres that are recorded annually. Tearing the land asunder, the wash-outs now revealed the forests exactly where they once grew heavenwards; the Araucarias returned to the surface of the land in a landscape now dominated by the Madre e Hija extinct volcano.

Also on the surface lie the remains of stone workshops, burial sites and other such evidence of man's presence here, but all this is recent history, belonging to the last second of the day 31st December on our geological calendar. These primitive hunter-gatherers of Patagonia, amongst the earliest inhabitants of our land, lived a scarce 12000 years ago.

Useful Data

Bosque Petrificado Natural Monument

National Decree Nº 7252 of 5th May 1954 was the origin of this Natural Monument, sited in the Patagonian steppe that today covers an area of 61.245 hectares. The name refers to the deposit of petrified tree-trunks that lie on the surface, the largest in the country

Points of interest include the paleontological interpretive trail that starts at the ranger station, and the Madre e Hija extinct volcano a few kilometres away, reached along Rt 49.

The area can be visited from Comodoro Rivadavia (320 Km to the north) or Puerto San Julian (230 Km south), along Rts 3 and 49. The junction of these roads is at kilometre post 2074 on Rt 3. In Comodoro Rivadavia, reached by several daily flights from Buenos Aires, one can rent a car to reach the natural monument. And from Caleta Olivia (220 Km north), tour operators can be contacted. The park is open from 9 am to 7 pm between October and March, 10 am to 5 pm April to September. The only facility in the park is toilets; there is no water, fuel, nor reception building; the visitor must bring water, food and fuel as the nearest city is 220 Km away - Caleta Olivia with three hotels, a camp ground, restaurants, supermarkets and service stations. Puerto Deseado is 252 Km NE and has a similar offer of facilities. Estancia La Paloma, 20 Km before the natural monument, on Rt 49, has a camp ground with bathrooms and fire-sites. When approaching from the north the last place where lodging, food and fuel are available is Fitz Roy 240 Km on Rt 3; from the south it is Tres Cerros (90 Km, also on Rt 3).

The climate is windy with a great daily temperature variation. Average 19ºC in summer (maximum up to 40) and 7ºC in winter (minimum down to -15ºC). Some 200 mm of precipitation each year, mostly in winter. Considerable snow in colder months. Westerly winds average 70 kph with blasts up to 140. The best time to visit is in spring or summer. Nearby attractions: Caleta Olivia (a petroleum town), Puerto Deseado (Fishing and nature reserves - the Ria of Deseado, Cabo Blanco, Isla Pingüino, Bahia Laura); Puerto San Julian (launch excursions to see Commerson's dolphins, sea-bird roosts; Estancia La María where there is an exceptional display of rock-paintings.

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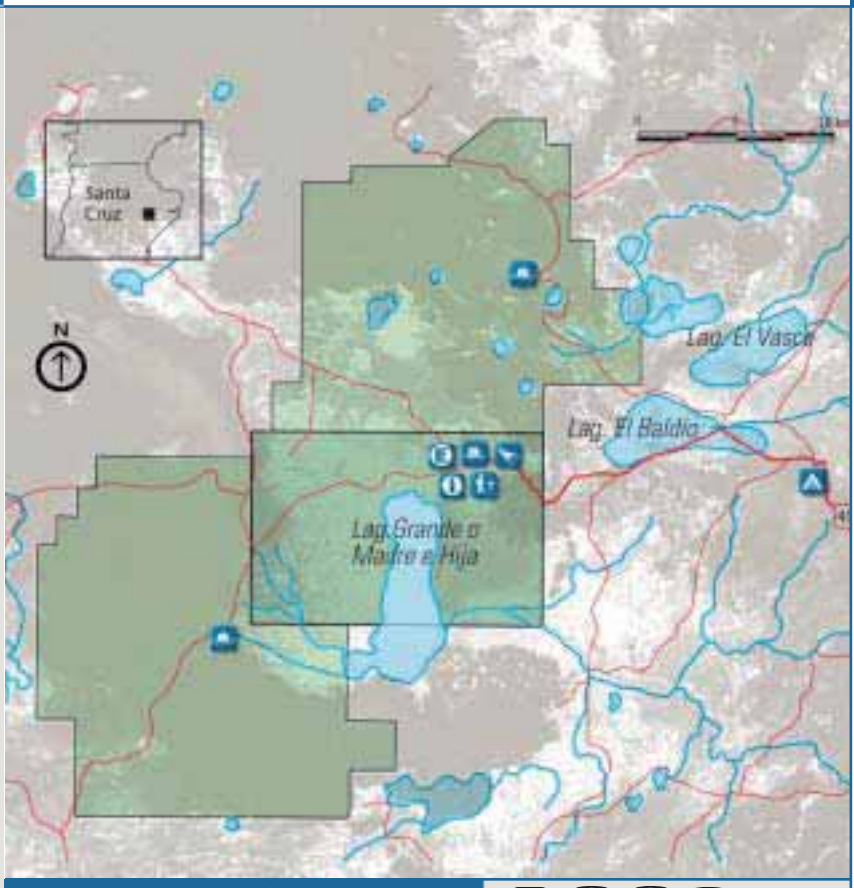

Recreational Activities

Hikes and wildlife observation

An easy self-guided, pamphlet-interpreted walking trail some 2000 metres long facilitates a visit to the main deposits of petrified tree-trunks. For the more daring there is the challenge of climbing the Madre e Hija extinct volcano also known as Horqueta, the highest point of the natural monument at a humble 405 metres above sea-level. The mount is crowned with curious basalt columns that tell of the volcanic origin of the feature, and offers wonderful views, especially at sunset.

As prizes, any walk might be enlivened by the sighting of lesser rheas, black-chested buzzard-eagles, long-tailed meadowlarks, rufous-collared sparrows, Patagonian pichi armadillos and the ever more curious guanacos. To see the grey foxes you do not even have to walk - there is a pack that usually welcomes visitors to the area right beside the site information building. Here there is a small museum which should not be missed. Amongst other artefacts of bygone days there are fossil pine-cones, trilobites, arrow-heads and "bolas" from the Indian boleadoras for tangling the legs of hunted animals.

Grey Fox

Species of Value

Magellanic Horned Owl *(Bubo virginianus)*

Adorned with feather tufts on the head, resembling longish "ears", this is the largest owl in Argentina, some 50 cm long. It is exclusive to the southern South America and its look-alike, the great horned owl resides in the rest of the Americas. Within Argentina, the varied habitats it frequents include woods, savannahs, gorges, upland grasslands and steppe. Like all nocturnal birds of prey the talons are very strong and sharp and its sight and hearing unbelievably acute. It can turn its head 180º and its feathers are structured so as not to make the slightest sound in flight. Small rodents are its main prey, though it also takes birds and the European hare, generally at night. During the day it can be found perched in a tree or under a bush or rocky outcrop. Usually solitary, it is found in pairs only during the nesting season. Nests are on the ground between bushes, in crannies in rocks, hollow boughs, sometimes using the abandoned nests of other species. 2 or 3 white and rounded eggs are laid. Like all owls, in folk tales and beliefs, it is often associated with wisdom or the devil.

The work of ants

It would seem that it is an irresistible temptation to take home a piece of eternity. Before the area was protected the stone woods were relieved of fossilized pine-cones, branches and even some gigantic trunks. Even by today's visitors, the temptation is still there to sneak away a "little bit of stone". In only one year the rangers have confiscated seventy kilos of petrified wood fragments. It is shameful that our greed for souvenirs is achieving what millions of years of cataclysmic events failed to do: to eliminate all traces of our oldest and most treasured antediluvian vegetation.

Guanaco
(Lama guanicoe)

All it needs is the hump. Then it would be the perfect camel, the largest in South America, to be precise. Its long neck and legs, the split upper lip and the cushioned hooves are all camel characteristics. Further, it has the elliptical red blood corpuscles (shared by amphibians and reptiles) the only mammal family to have this feature. Its distribution extends from Tierra del Fuego to Peru along the Andes, and to the Atlantic coast in its southern reaches. Perfectly adapted to the meanness of its habitat it is not demanding in its nutritious requirements, even feeding on lichens and the bark of bushes, and can tolerate long periods without drinking as indeed all good camels should. Dew and metabolic water are enough. If drought extends unreasonably it will make do with saline or sea-water. This is a champion survivor. After decades of protection, the troops in the Bosque Petrificado Natural Monument have become used to man's presence and allow for long periods of observation on the slopes.

Rebel Patagonia

Jaramillo, the old Patagonian Railway station, is the nearest locality to the Bosque Petrificado Natural Monument (135 Km). In 1921, by the tracks, the 10th Cavalry Regiment executed the Entre Rios gaucho Jose Font, better known as Facon Grande. He was one of the leaders of the strike that Hector Olivera wrote about in his Patagonia Rebelde, based on research by Osvaldo Bayer (Los vengadores de la Patagonia tragica). The scene in the film of the event was also shot at Jaramillo. Actors were Federico Luppi as Facon Grande and Hector Alterio as Col. Hector Varela who, under pressure from southern sheep farmers, mostly English, ordered the execution of farm labourers (1500 according to certain sources). Their demands were for better living accommodation, three plates of food per day, days of rest when the weather was too foul and a first-aid kit with instructions in Spanish

Tierra Del Fuego

National Park

It could be said that this is where the Andes mountains fall into the sea. Indeed, they seem to end right on the southern border of the park, on the shores of the Beagle Channel. Until recently this was the only national park with sea shore. This, together with its position at the tip of the continent, gives it a special aura of enchantment and mystery. Inland this geography of the end of the world displays all its attractions - dreamlike woods, lakes of indescribable colours, mountains and valleys, peat-bogs. As if this were not enough, there are many archaeological sites and signs of historic lumbering. The park invites one to wander and wonder, contemplating nature, though there are also activities such as river descents in canoes and sport fishing.

Only a few kilometres west of Ushuaia and up against the border with Chile, Tierra del

Lapataia river. *Top left corner:* Magellanic Woodpeckers. *Top left:* Beaver dam. *Top right:* Fueguian Red Fox.

Fuego National Park encompasses an important sector of the Fueguian woods. The mountain ranges, running parallel and west to east, are separated by valleys of glacial origin. These descend from 1500 metres above sea-level at the Vinciguerra range south of lake Kami (also known as Fagnano) to sea-level. On the coast Lapataia bay is the only fjord on the Argentine side of the channel, and Zariatiegui cove is another indentation of note. The park also contains two large lakes shared with neighbouring Chile, Kami (or Fagnano) and Acigami (or Roca).

The woods are the main feature of the landscape and cover some 25000 hectares (36% of the park and nearly 4% of the wooded area of Tierra del Fuego Province). Each season of the year has its enchantment: the festival of spring and summer greens, the furious reds of autumn when the lengas *(Nothofagus pumilio)* that cloak the slopes seem to burst into flame, or the delicate snow crystals hanging on the branches of winter. Lenga woods are the most extensive, growing in valleys, terraces and slopes, especially in drier areas up to 600 metres above sea-level. With rising ambient humidity they become associated with guindo *(N. betuloides)* to form mixed woods. On the shores, with copious rainfall, the pure woods of guindo dominate, sometimes with winter's bark *(Drimys winteri)*. Some specimens exposed to the constant westerlies are shaped into the characteristic "flag" trees - with all branches downwind from the central trunk. The undergrowth has several thorny bushes such as Berberis with yellow of orange flowers *(B. buxifolia and B.darwinii)*, or chaura *(Pernettya mucronata)*. In damper places ferns and the local strawberry prosper.

Ñire *(N. antarctica)* concentrates on the edges of the peatbogs though sometimes grows at tree-line. The vegetation that

Tierra del Fuego
National Park

dominates the heights (above 600 m) is small bushes, cushion plants and grasses that alternate with upland meadows. The peat-bogs are mainly formed by Sphagnum magellanicum moss and are a singular characteristic of the park. These deep mats of wet and spongy vegetation line the bottoms of the glaciated valleys.

It is common to encounter a Fueguian red fox, a race unto itself, endemic to the woods on the island, but the guanaco is more difficult to see in summer when, during the heavy tourist season, it takes to the heights, only descending to the lowlands in winter. The guanacos of Tierra del Fuego are unusual in that they are denizens of the woods, when in other regions it is an animal of open spaces. The southern sea otter is sometimes seen on the shores of the Beagle Channel, one of the four species of these animals in South America and one of the most rare and unusual in its selection of habitat. The park is a wonderful place to watch birds. Several species of sheld-geese, black-faced ibis, many ducks, two or three oystercatchers, petrels and black-browed albatross can all be seen on or near bodies of water or from the seashore. In the woods the austral parakeet and thrush, night herons, the thorn-tailed rayadito and the gigantic magellanic woodpecker can all be seen. Gliding on spread wings, both the Andean condor and the black-chested buzzard-eagle patrol the area.

Useful Data

Tierra del Fuego National Park

The park dates from 30th September 1960 when law 15554 was passed creating it. The biome is southern sub-Antarctic woods and it covers an area of 68,909 hectares. The park takes its name from the archipelago where it is sited. Magellan baptized the island (Tierra del Fuego - Land of Fire) in 1520 for the numerous fires on land, signals from one band of Indians to another that something unusual (ships!) was to be seen.

Points of interest in the park are the Rio Pipo waterfall, Lake Acigami (or Roca), Laguna Negra, beaver ponds. To get there go west from Ushuaia along Rt 3 (12 Km of paved road), or take the prison train or the catamaran from Ushuaia docks. Ushuaia is connected by regular flights and bus services to the rest of the country.

There is an entry fee charged, reduced for university students, local tourism, provincial residents; free for pensioners and children under 14 years of age. The park is open year round. There is a concessioned camp-ground in the park with bathrooms, fire-sites and a tea-house (at Lago Roca) and three areas where free camping is permitted (Ensenada, Rio Pipo and Entre Rios island). The tea-house at Lago Roca serves meals. Ushuaia has all manner of services.

The climate is cool/cold and damp, with little thermal variation between seasons (7.5ºC). Average yearly temperature is 5.6ºC. Precipitation on 200 days per year, evenly spread through the seasons. Snow inland and on mountains from May to September. The best season to visit is between October and April as snow can limit movements the rest of the year. Nearby attractions are Ushuaia, the southernmost town that has many and varied points to visit, Cerro Castor ski centre (26 Km away), Harberton estancia 85 Km east of town, with lodging and museum, the Bridges Islands on the Beagle channel (sea-birds, sea-lions) lake Kami (or Fagnano) 100 Km from Ushuaia, and Lago Escondido (55 Km from town).

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Recreational Activities

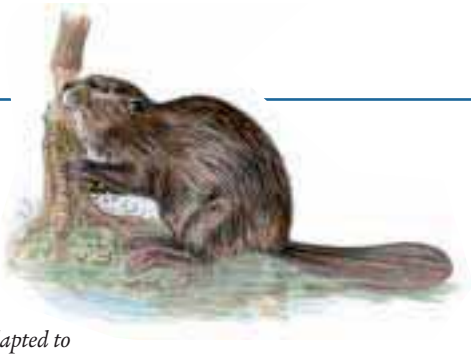
Trekking

In the park there are trails for all tastes. Pick one and off you go to enjoy nature. Some of the simple alternatives require less than two kilometres of walking on well sign-posted trails that lead to points of interest (peat-bog, beaver dam, Laguna Negra), through the lenga woods or follow the shore, with excellent views of the Beagle Channel and the Cormoranes archipelago.

Other trails are more demanding. One leads through the woods to Pampa Alta where one can get a spectacular view of the sea-coast. There is a trail between Lapataia bay and Zaratiegui cove. Or another up Cerro Guanaco nearly one thousand metres high. This last is along a steep trail, 8 Km long, that takes seven hours.

The most daring outdoorsmen can opt for the Andorra/Oveja circuit through the valleys of those names and to the Caminante lagoon. It is 20 Km long and requires at least two days, with tenting - but no fire - permitted in the area of the lagoon. This is only recommended for those with mountain hiking experience and a good sense of direction. Without these it is wisest to engage a licensed guide (consult the Park HQ in Ushuaia).

Species of Value



The Beaver
(Castor canadensis)

This large rodent is known for its engineering of dams built with twigs and branches on any stream. It is perfectly adapted to a life in the water - large webbed hind feet, a protective nictitating membrane over the eye, nostrils, eyes and ears in a line at the top of the head so that a minimum is exposed above water to use three of its senses, the lips close behind the huge incisors for swimming with a branch without getting a mouthful of water.
Originally from North America, this animal was introduced to Tierra del Fuego in 1946 by the Argentine Navy as a project for fur trade. The 25 pairs released in the Rio Claro watershed that drains into Lake Kami soon increased, without natural predators or any competitors for the resources. Today the beaver is not limited to Tierra del Fuego but has populations on the mainland near Punta Arenas.
Beaver dams in the national park are amongst the main curiosities and people can watch the animals about their work, swimming or repairing their constructions. There are at least 15 sites with active beavers within the national park. .
In spite of their popularity, beavers have a severe impact on the habitat. Fueguian woods are not adapted to such activity - they are slow-growing, and are much affected by the felling and flooding by these animals.
In an effort to reduce numbers and their effects on the nature of the area, there is a programme for culling/eradication that includes trapping and destruction of their dams.

The prison train

There was once forestry practiced in the area now occupied by the national park, from the end of the XIXth century. The most intensive exploitation of the forests started in 1910 when the prison was established in Ushuaia. The area affected was between the Pipo river and Mount Susana until 1947. A narrow gauge railway transported the prisoners to work in the woods and home again - to prison. Still today there are vestiges of this activity in the numerous embankments, cuttings, trails and stumps of trees felled by axe. In the forest proper there is regeneration. In places one can yet find the characteristic conical log shelters the lumbermen used.

When the prison was closed the train still transported forest products to the Lombardich's saw-mill near the peat-bog in the Pipo river valley. It was an earthquake in 1949 that stopped operations. Part of the run is today used for a tourist steam-train to take visitors to the protected area to see the wonders.

Lords of the Channel

Humans have been in Tierra del Fuego for some ten thousand years. However, the evidences found within the national park, especially on the shores of the Beagle Channel date from about 6000 years ago and stretch into historical times. The region was the domain of the Yamana people, boaters supreme who sailed the waters of the channels in their primitive canoes made from sheets of lenga bark and cross stays. The sea was the centre of their life and their provider of food: hunting sea-lions and collecting mussels and such. Their encampments on the shores were made of flexible boughs of trees. Remains of these sites are the numerous "concheros" (shell mounds) scattered throughout the area. They are usually circular with a dip in the middle, accumulations of their waste over time - shells of molluscs, bird and mammal bones, some remnants of fire.

In the XIXth century, in spite of the diminished size of their territory (one fifteenth of that occupied by settlers on mainland Patagonia), there were twice as many indigenous magellanic boat-people. But the Yamana vanished rapidly with the arrival of white men at the end of that century. Of the three thousand counted by the first missionaries, ten years later (1890) only one thousand yet lived, and by 1910, but one hundred survived.

Magellanic Woodpecker
(Campephilus magellanicus)

One of the largest woodpeckers in the world and, with its 40 cm length, certainly the largest in South America. Jet black overall, males sport a bright red hood and short crest, while females have a long, forward-curling and wobbly crest with some red around the base of the bill.. Both have white in the wings that is seen in flight. Their main food is insects and their larvae found under bark or within the trunks of the trees which they find by chiselling and scraping away the bark, or drilling small holes. This they can do because of the toes splayed to four corners, and the stiff tail that acts as the third "leg" of a solid tripod. Laughter-like calls give it away in the woods as does the double thump characteristic of the genus. Nests are dug preferably in vertical trunks, usually some 15 metres above the ground. Thin-shelled, spotless shiny white eggs are laid.

Fueguian Sundew *(Drosera uniflora)*

The scientific name of this plant comes from the Greek "drosos" (dew) because on each leaf there are droplets at the tip of tiny reddish "hairs", and they always shine. Such a delicate design is but a lure to attract insects - sundew is a carnivorous plant. The droplets are sticky and hold the victims fast as they try to escape. Each of its movements worsens the insect's situation.
The end is that they are channelled towards the base of the leaf where other protuberances release digestive enzymes. The process takes a few days after which there only remain vestiges of the "meal". ***Drossera uniflora*** *is one of the least known of the numerous sundew family and grows in damp areas by peat-bogs in Patagonia, especially in Tierra del Fuego and the Malvinas islands. It is barely a few centimetres tall and the leaves are spread in a star pattern.*
The single white flower is put out in January and February

Lago Puelo
National Park

Pablo Neruda wrote: "whoever has not known the Chilean woods, has not known the planet" in his *Confieso que he vivido* (I confess I have lived), and he had plenty of reasons; he grew up in Temuco, that deep, damp south of Chile in the "relentless rainy latitudes, with draining, dripping nights and morning ponds". Surrounded by volcanoes, glaciers and lakes, his child's eyes understood the fragrant tangle of the Valdivian forests (*"a vertical world, a nation of birds, a horde of leaves"*) and his poetry inherited the exuberant foliage, the *"watery chuckle"* of the chucao tapaculo, tempests that release *"all the music on earth"*, *"the wild scent of the laurel"*, *"the darkness of jalap"*.

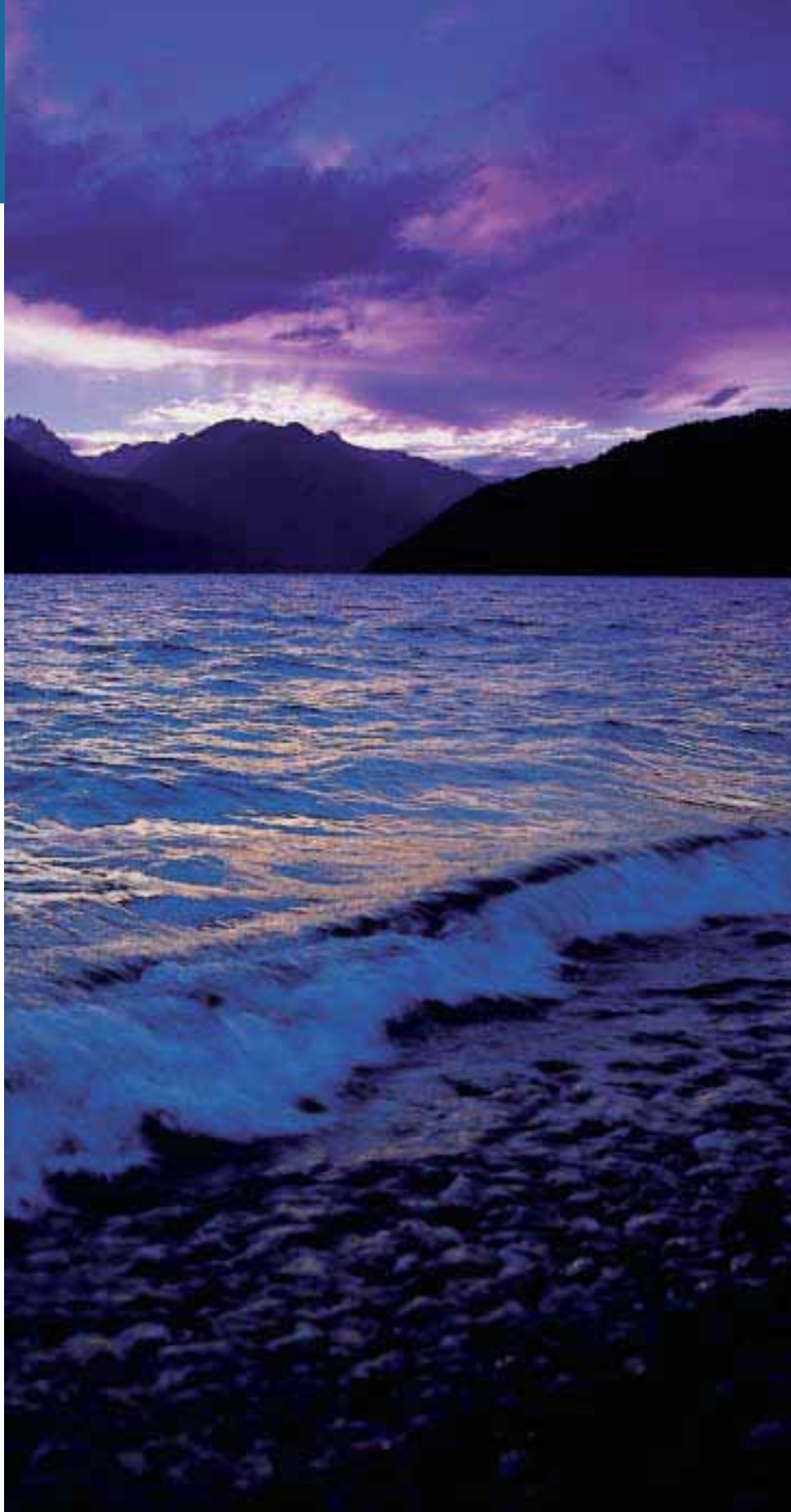
Puelo lake drains to the Pacific along a valley of undisciplined profiles, the lowest pass through the Andes range at 223 metres above sea-level. This connection, together with the tempered microclimate caused by the nearby ocean and the low elevation of the lake, allow Neruda's woods to poke through the mountains and appear on the eastern side of the range. Contrary to the direction of the drainage, plants that are typical of the Valdivian forests and not found growing on this side of the Patagonian cordillera, invade Argentina and give Lago Puelo National Park a flora that is unique in the country.

What are the species involved? Four trees open the list: the "hazel/avellano" *(Guevina avellana)* of the Proteaceae (a family best known from South Africa), the splendid "ulmo" *(Eucryphia cordifolia)*, the "tique" *(Aextoxicon punctatum)* with its olive-like fruit, and the "lingue" *(Persea lingue)* related to the avocado pear. Shrubs add to the list the white-thorned *"repu"*

that the indigenous peoples used to rub twigs together to start a fire, "picha-picha" of the Myrtle family, "luncillo" that is almost the size of a tree, Griselinia racemosa with its tiny purple flowers, and the "deu" or "mataratones" (rat-killer), also known as "huiqui" *(Coriaria ruscifolia)* with so toxic a fruit that it is used as a poison for controlling rodents, and Chief Manqueunai is said to have used it to kill the missionary Jose Guillelmo in 1716 so as to keep secret the existence of the strategic Vuriloche pass through the mountains. Finally we must list three lianas "white voqui" with its strong and penetrating perfume, "red voqui" *(Hydrangea intergerrima)* and Cynanchum diemii.

But the botanical attractions of the Puelo basin do not end with the trans-Andean peculiarities. The pure stands of "pitra" or "patagua" *(Myrceugenia exsucca)* woods that have no equal anywhere in the southern Andes range. This is a waterside tree related to the more famous "arrayan" *(Myrceugenella apiculata)*. There are representatives of all of the five genera of Andean Patagonia's orchids. And this is one of the three national parks that protect the red-wood equivalent, the "lahuan" *(Fitzroya cupressoides)* though here specimens are relatively young - only three or four centuries old, though at the foot of mount Vanguardia. there

Right: Lago Puelo. *Top left:* Mutisia. *Top right:* Chucao Tapaculo.



Lago Puelo
National Park

Turbio river

are several in the millennium age-group. The NW slopes of the Currumahuida cordon is where are found the largest pure stands of the austral cypress *(Austrocedrus chilensis)* in the country; the Melo watershed in the wilderness area is the place with the highest floral diversity in all the southern beech woods (or sub-Antarctic forests). There are always surprises to be discovered - two species of ferns new to Argentina were recently reported.

In spite of its small size (27,674 hectares) the park possesses riches in the faunal line; between the Andean condor and the green-backed fire-crown (a hummingbird) there are 132 species of birds - some 13.4% 0f the total for Argentina. Three of these are on the list of special targets for conservation efforts - the torrent duck, the Chilean pigeon and the ochre-flanked tapaculo. In mammals there is the pudu - the world's smallest deer, and the threatened huemul or south Andean deer, as well as the marsupial "monito de monte" *(Dromiciops gliroides)* - see p 224. Though the introduction of voracious trout for sport fishing has played havoc with the populations of the native species, the "peladilla listada" (Haplochiton sp) is still found in Puelo's watershed. Even in the amphibians there is an exclusive species with the silvery-green frog (Eupsophus emiliopugini), so far endemic to the national park in Argentina.

Useful Data

Lago Puelo National Park

The park came into being as an adjunct of Los Alerces National Park in 1937, but became a park in its own right on October 11, 1971, by national law Nº 19292. It protects an interesting and unique sector of the southern Andes' woods over an area of 27674 hectares; the name is from the Mapuche "puel" for east and "co" - water, hence something like "water in (or from) the east". Points of interest are La Playita, Pitranto Grande, Los Hitos, Arroyo Las Lágrimas, El Desemboque, Río Turbio. To reach the park from Bariloche take Rt 258 southwards to El Bolson, then Rt 16 to the park HQ, a total of 135 Km. From Esquel, head northwards on Rts 40, 258 and in to the park on 16 (155 Km). The locality of Lago Puelo, which is 4 Km from the park, has daily bus services from Bariloche and Esquel. In Puelo village it is possible to take a taxi or the services of a tour agency. There are daily flights to Bariloche from Buenos Aires and from Cordoba and then take an excursion or rented car.

The park charges an entry fee, with discounts for Argentines, Chubut province residents and university students. Entry is free for pensioners, children under 14 years of age and residents of the Comarca Andina Paralelo 42. The park is open around the clock.

For food, lodging or gasoline, the park has campgrounds at the northern end of the lake in the recreational area, one of which is a concession with facilities such as fast foods, a store for provisions, hot water around the clock, electricity, firewood, security guards. Camping is also permitted at the south end of the lake at Rio Turbio and Arroyo Agujas Sur, and at the mouth of Arroyo Las Lagrimas. Lago Puelo village (4 Km) and El Bolson (16 Km) have hotels, inns, cabins for rent, hostels, campgrounds, restaurants, fast food outlets and service stations.

The climate of Lago Puelo is cool and damp but being at a lower elevation than other parks in the region, it is more temperate. Average summer temperature is 17ºC (rising to a maximum 32), average in winter 5ºC (descending to –6ºC). Rainfall is between 1250 and 2650 mm annually, mostly between May and August; occasional snow in winter.

The ideal time for a visit is spring, summer or early autumn; local attractions include the Comarca Andina Paralelo 42 (including El Bolson, Lago Puelo, El Hoyo, Epuyen, El Maiten and Cholila), and at a distance of 205 Km, Los Alerces National Park.

For further information contact
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U9211ADA Lago Puelo
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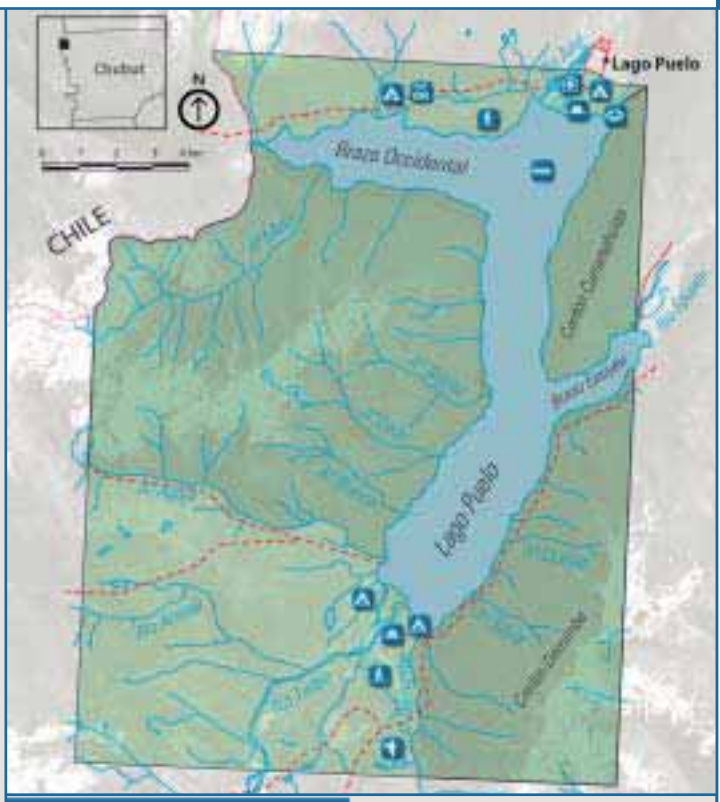

Recreational Activities

Hiking - Trekking

At the Recreational Area at the northern end of lake Puelo there is one of the few sandy beaches in the region where the waters are comfortably warm (up to 22ºC in summer). It is also from here that launches depart for a visit to Los Hitos, El Desemboque and Rio Turbio. Here too one may contract fishing excursions or nature-watching outings, or discover the secrets of the patagua on the interpreted nature trail called "Bosque de las sombras" (only 400 metres long and an easy stroll, self-guided, with a printed pamphlet).

It is from this area that three trails head off, all worth a visit: one to Mirador del Lago (1500 metres above sea level), 800 metres long, climbing; another trail through Pitranto Grande, an easy 850 m stroll; and the trail to Los Hitos on the Chilean frontier, to see the captivating rapids on the Puelo river (8 hours out and back, fairly demanding, with the possibility of camping overnight at the Arroyo Las Lagrimas campsite by the Border Guards' station). The trail leads on to the Pacific Ocean, a further 5 or six days walking.

El Turbio at the head of the lake, completes the offer of hikes, with two long hauls - trails to Lago Esperanza and to the refuge at Cerro Plataforma in neighbouring Puelo Provincial Park. These take at least two or three days respectively. One can reach Turbio either on the launch excursion or by hiking in from El Desemboque (near El Hoyo) along the western slopes of the Derrumbe range (one day). At Turbio, close to the ranger's house, is the campground which serves as a base of operations in the area.

Pitras woods

Lago Puelo
National Park

Species of Value

The Monito de Monte
(Dromiciops gliroides)
a tiny marsupial

The common local name is misleading - it is not a little monkey (monito) - and does not prepare one for its mouse-like appearance. Like the koala of Australia, it is a marsupial with arboreal habits - young are first raised in the mother's pouch. The species is only 23.5 cm long (including the tail) and weighs but 28.6 grammes. It is considered a "living fossil" and is the only extant species of the Microbiotheridae, a family of diminutive marsupials once thought to be extinct.
It lives exclusively in the South Andean woods between Neuquen and Chubut provinces, and prefers dense stands with patches of the local colihue cane as it needs the leaves of these to make its ball-shaped nest. Its grasping extremities (including the prehensile tail) are adaptations for an arboreal life and the tail is also a reservoir of fatty tissue for times of dearth. The huge eyes indicate that it is nocturnal in habits; omnivorous in diet but showing a marked preference for invertebrates. Locally it is believed to be a bad omen. On lists of fauna its conservation status is "undetermined".

Ulmo
(Eucryphia cordifolia)

*This is another trans-Andean visitor. Its imposing stature of up to 40 metres is somewhat less in our country. It is rare even in Chile where demand for its magnificent wood exposed it to an indiscriminate over-exploitation. The bark is like an elephant's skin and the profuse white flowers provide a spectacle between January and March, creating an illusion of snow-covered tree-crowns (**"The sweet cross-shape of the ulmo, with bushels of flowers"**, write Neruda in **Canto General**). This prodigious flowering has made of the tree an important asset in bee-keeping and honey production in Chile. Ulmo honey is famous for its exquisite fragrance.*

The Local "Hazel" (Avellano)
(Gevuina avellana)

Also known as guevin, this is one of the species of the Valdivian forests which give Lago Puelo National Park its unique character. In Chile it grows to some 20 metres in height, but on this side of the mountains it is but a small tree with shrubby demeanour. Its nut, which is rich in nutrients, resembles the flavour of the European hazel nut and is sold in Chile as Praline. Ground up it serves as a substitute malt coffee. The wood has a lovely grain and was used by the original inhabitants to make stirrups. Today it is used for boat-building, oars and musical instruments.
The species is abundant in the protected area, especially in places growing back after old fires.

A cowboy story

Martin Sheffield

Valle Nuevo as the area where the national park is located used to be called, has a wonderful collection of rock-art sites though it seems that the area was more a land of passage than of settlement for the original people of Patagonia. Its permanent settlement was left to Europeans and started at the end of the XIXth century, two and a half centuries after the Spanish Captain Juan Fernandez discovered Lake Puelo in his search for the mythical City of the Caesars. Original settlers came from Chile, pressured from behind by the massive arrival of German settlers to the Llanquihue-Osorno area. Edward VII's commission determined that the area was in Argentina and the origin of the colonists changed though it was still from all over.

"There were hardly any Argentines - perhaps a policeman or military man" Antolín Diaz Gonzalez remembers; he is the grandson of one of the first settlers of El Bolson. "There were too many outlaws" adds Enrique Merino, another descendant of the pioneers. "Butch Cassidy's gang had a house in Cholila and they assaulted a storekeeper in Los Repollos. Governor Fontana sent the border police to put an end to their banditry and the cattle rustling that were a constant threat to the large English farms. There were still indigenous communities and even a Stateside sheriff - star badge and all - Martin Sheffield who invented the famous monster of loch Epuyen story. He was handy with a knife and an amazing shot. When in his cups at a dance, he'd have fun shooting the heels off the ladies' shoes. My father, who was one of his friends, said he herded horses by shooting them through the ear to keep them on the track. He died while looking for gold in Arroyo Las Minas - some say poisoned by drinking kerosene as his rum had given out, others maintain he was murdered for two kilos of gold he'd found. In those days life here was like a film of the Far West.

The Chilean Pigeon *(Columba araucana)*

Typically of the South Andean woods this species is recognized by the vinaceous chestnut colouration and the white nuchal band. Of considerable size (34 cm) it is seldom if ever seen walking on the ground as some other pigeons do, preferring to stay in the trees where it gets all its food from fruits - including the miniature avocados of the lingue. It nests in the trees - a rudimentary platform of twigs, where the female lays one egg (rarely two). Both members of the pair incubate between December and March.

The species was once very abundant in the stretch of Andes between Neuquen and Chubut but in the 1950s Newcastles disease was contracted from chicken farms and this nearly exterminated the species. Today, fortunately, the population is recuperating and expanding though the species is still considered vulnerable. Flocks of these pigeons can again be seen flying over the national parks of Lanin, Nahuel Huapi, Lago Puelo and Los Alerces.

Los Arrayanes
National Park

Light and shadow break up the forms in the forest and scatter the colours - the white of the blossom, the dark green of the foliage, the strong cinnamon colour that tannin contributes to the bark, the wishy-washy grey of the dead wood. The myrtle woods of Quetrihue look like nothing so much as an impressionist painting. The purity of the woods and the imposing majesty of some of the specimens that are over two and a half centuries old, make these woods one of the most captivating manifestation of nature.

And also one of the most unique. In spite of the relative abundance of the arrayan myrtle which grows in damp places on both sides of the Andes mountains of Patagonia, there are few sites with communities of such characteristics. A mere handful on the Chilean side and in Argentina but one is comparable, just across the water at the northern tip of Isla Victoria. With this mix of peculiarities spiced with a power of seduction, the ecological importance, added to its tourist attraction, it is not surprising that the woods are conserved under the strictest framework of management.

It is undoubtedly the most popular patch of woods in the country - each year some 250,000 visitors walk through the twelve hectares on boardwalk trails that preserve the soil from being compacted and respect seedlings; thus are eliminated the severe impacts that such heavy visitation would provoke. Today, in high season, it can resemble an ants' nest; not long ago it belonged to a single family.

In 1905 one Carlos Smith Cusack holds the title deeds of Plot 10 of the Nahuel Huapi Rural Colony. Twelve years later he sold the property to the pioneer John O'Connor. The property was but the tip of the peninsula know as Leon or Mascardi. The good doctor believed that he had purchased the whole peninsula and called it Beatrice in honour of his wife, Lady Grace Beatrice Richmond Oxley. He built a couple of houses and a shed for his holiday home and died soon after without knowing that a short distance from his homestead was one of the botanical curiosities of the planet.

Antonio Lynch, his wife Elisa and brother-in-law Manuel Uribelarrea bought the property

Arrayan myrtles at Quetrihue. *Top left corner:* Specimen of Arrayan myrtle.

from the descendants of O'Connor in 1931, and four years later, the rest of the peninsula from the National Parks Board of which Lynch was a member. Just as Ezequiel Bustillo (the factotum of our infant parks system) had done, Lynch fell under the "bewitching power of Nahuel Huapi" when he visited the Ortiz Basualdos on their estancia at Peninsula Huemul, across the water. "My father was madly in love with the place though it was not till 1934 that he discovered the treasure it contained, having been told about it by a settler of Cumelen" relates Maria Teresa Lynch.

It was at that time that the peninsula got its name - Quetrihue, which means "place of the arrayan myrtle" in the Mapuche language. Lynch did more - he cleared the underbrush, designed trails to the site, built a jetty and a log cabin where tea and scones were served, all to encourage visitors. Local tour guides insist on calling it Disney's cabin and spread the untrue story that it was here in the fifties that Walt Disney found inspiration for his "Bambi". But Disney never was in Quetrihue, and Bambi had had its first showing before Disney visited Buenos Aires. The story was just a figment of the imagination of one of the early guides to draw attention, but has been gathering force ever since.

With peronism in power, the winds of change were blowing for

Los Arrayanes
National Park

Quetrihue. In 1946 the National Parks Board asked Lynch not to charge access to the arrayan woods in order to "let tourists learn about the wonders of nature within the country", and two years later a law was passed for incorporating the "properties that exist in the national parks that, for their beauty or for reasons of scientific interest, justified" their inclusion in the public domain. Lynch did not wait for the law to come into force and thereupon donated the arrayan woods to the National Parks Service. This gesture was not enough: on the 9th of February 1950, just days after accepting the donation, a decree signed by President Peron himself expropriated all the peninsula except for 100 hectares around the estancia homestead.

Twenty one years later, national law Nº 19,292 fixed the borders of our main nationally protected areas and Quetrihue became a National Park in its own right, having been till then a part of Nahuel Huapi National Park. Though nothing changed in the administration and management of the area, the measure gave the 1796 hectares an increased value for conservation. Not only the arrayan woods benefited; the peninsula is home to 157 species of plants, 65 of birds, 13 mammals, 2 amphibians; and on the lakes in the interior - Patagua and Hua Huan - there is a remnant population of the Andean otter or huillin which figures in red on the list of endangered species in Argentina. Some of the rock-faces and shelters bear samples of the art of the original peoples of the area.

Useful Data

Los Arrayanes National Park

Los Arrayanes National Park came into being under National Law Nº 19292 of the 11th October 1971. It is entirely of Patagonian Andes woods over an area of 1796 hectares.

The name is for the famous arrayan woods at the southern tip of the Quetrihue Peninsula ("Place of the arrayan myrtle" in the Mapuche language). Places of interest are the woods themselves (the main attraction), the Estancia Quetrihue homestead, the Patagua and Hua Huan lakes and an overlook viewpoint. To reach the park there are lake excursions from Puerto Pañuelo in Bariloche, or from La Mansa and La Brava ports in Villa La Angostura. On foot or on a bicycle one can visit the peninsula from Angostura. Villa La Angostura is connected to San Martin de los Andes by Rts 234 and 231 (111 Km), and with Bariloche by Rts 231 and 237 (77 Km).

There is a park entry fee with discounts for local tourism, provincial residents, university students; no fee is charged for pensioners and children under 14 years of age. Access on foot or bicycle is from 9am to 2 pm in summer, 9 to noon in winter. These visitors must leave by 5 pm or 3 pm respectively. Over-nighting is not allowed in the park. There is a tea-house in the arrayan woods (erroneously called Disney's Cabin). Both Bariloche and Angostura have all manner of tourist services.

The climate is cool temperate with average temperatures of 3ºC in winter, 14 in summer. Some 1300 mm of precipitation fall each year, mostly in winter, and there is snow between the end of July and September.

The best time to visit is between spring and early autumn. Lanin and Nahuel Huapi National Parks are nearby attractions, as are Angostura, Traful, Bariloche and San Martin de los Andes - all townships.

For further information:
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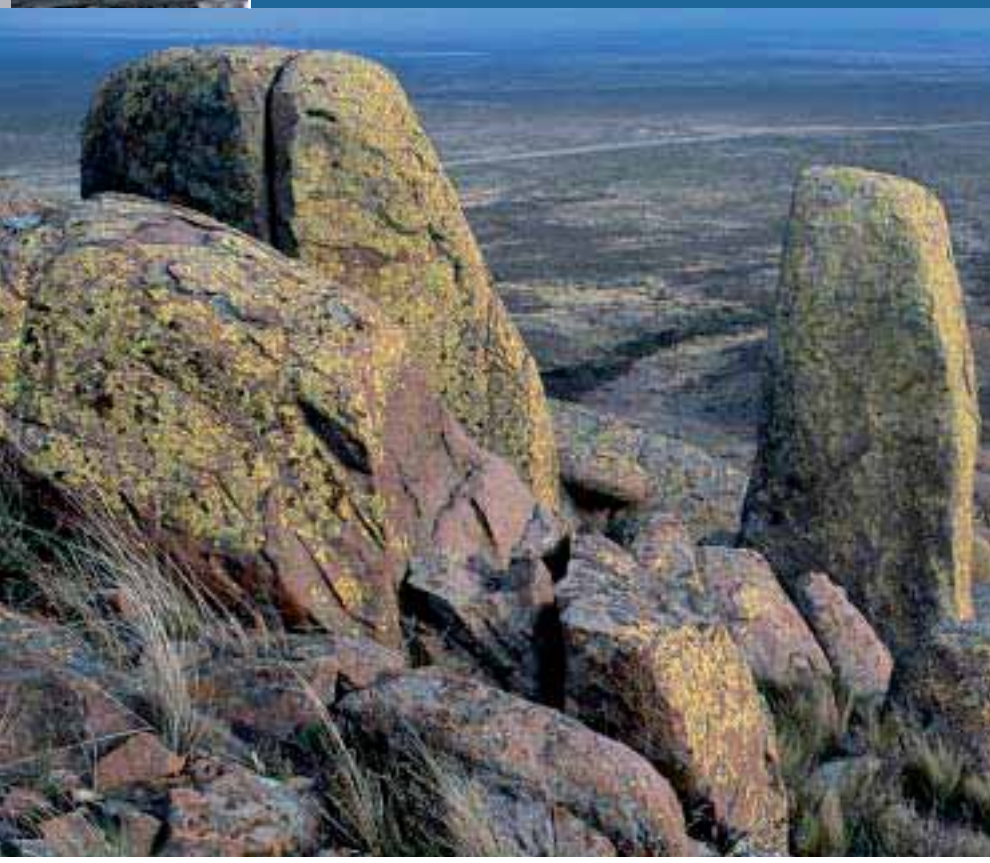
e-mail: nahuelhuapi@apn.gov.ar.

Recreational Activities

Cycling and hiking

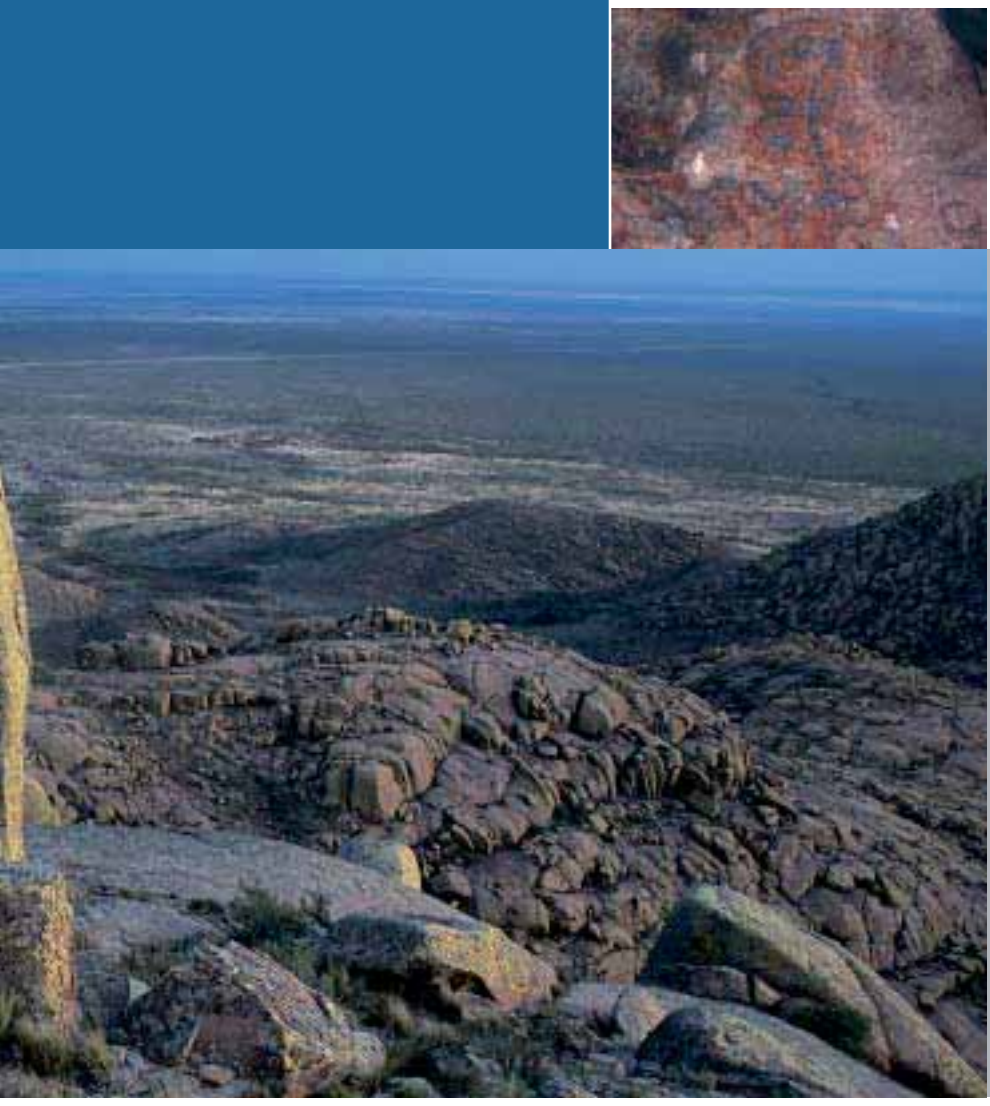
A twelve kilometre trail connects Villa La Angostura with the arrayan woods, along the Quetrihue peninsula. It takes some four hours on foot, or two on a bicycle - the same times for the return - but it is worth it. After the first kilometre there is a magnificent view of Villa La Angostura and the two arms of the lake that enclose the peninsula (Rincon and Machete) and the Ultima Esperanza stretching away NW. Half way along the trail one crosses the stream that drains Hua Huan lake. Patagua lake, the other body of inland water, displays its mirrored surface one kilometre before the end of the trail. From here on the arrayan myrtles start to appear till they become the dominant or only species. At the southern tip of the peninsula is the chief attraction of the park - twenty hectares of pure arrayan woods. These are visited along board-walk trails to reduce impacts on the soil and seedlings. The tea-house is for recuperating energy, while a boat service returns to Angostura. Those who decide to return overland, as they came, must do so before 5 pm in summer or 3 pm in winter.

Lihué Calel
National Park



The little Lihue Calel range of hills sprout out of the *Huecuvú Mapu* (meaning "land of the devil" in the language of the Araucano people), an apparently inhospitable steppe of wide horizons in south central La Pampa Province. The highest point (Cerro de la Sociedad Científica) barely reaches 590 metres above sea level. In such a vast plain, however, it seems much higher. The contrast is not limited to landscape characteristics; the outcrop of hills produces a microclimate that is much less hostile and damper than the surrounding wastes. Because of this, in the little valleys there grows a flora of unusual variety for the region.

Over 40% of the plants of the province grow here, and that is not counting lichens, ferns, algae and other lesser groups. Top of the list are three species endemic to this outcrop of hills: the Lihue Calel daisy (the provincial flower), melosilla, and a leguminous plant known to science as *Adesmia lihuelensis*. Other oddities are also listed - the "traicionera" ("treacherous one"), a cactus of peculiar aspect and wicked thorns, an airplant *(Tillandsia sp)* that grows flat against the rocks, and the only orchid recorded for the province. Following the course of the streams one finds a small patch of the Espinal woodlands biome in the majestic calden *(Prosopis calde-*



nia) the umbrella crown of which species adorns the provincial shield, together with alpatacos, *Jodinia rhombifolia*, and beautiful *Caesalpinia gillesii*.

For the animal life, the green vegetation around the hills is an irresistibly prodigious offer of habitat and food. It is no accident that the animal diversity should reflect the botanical. There are 173 species of birds, 42 mammals, 25 reptiles and 4 amphibians. The list includes threatened and endangered species at the national level (crowned eagle, yellow cardinal, peregrine falcon, lesser fairy-armadillo, Patagonian land tortoise), others that are locally persecuted (puma, plains viz-

Lihué Calel hills. *Top left:* Chalk-browed Mockingbird. *Top right:* Rock paintings.

cacha, grey fox, greater rhea, Patagonian cavy, red tegu lizard) and even exotic invaders such as the red deer and the European wild boar. But it is the guanaco that rules the area - if only by the weight of its numbers.

Man arrived because of the guanacos. The hills were inhabited by the northern Tehuelche people ("Günün a Kena" in their own language) and their forebears. These hunter-gatherers wandered over the great plains of Argentina as from 4500 BC to the period of the Spanish conquest, when they were amalgamated

Lihué Calel
National Park

into the Araucanian cultures. To them Lihue Calel was not simply an excellent hunting ground but a powerful place, charged with spirituality, as suggested by the burial site found at the foot of the hills and the black motifs on red background which are to be seen on the rock shelters and hollows. Much of the rock art has vanished over time and through human negligence, but some still transmits the enigmatic messages. The best preserved and most fascinating sample is to be found flanking the source of the Arroyo de las Pinturas. An interpretive trail (the trail-head reached on foot or by car) approaches these undecipherable paintings.

These "hills of life" (the translation of the name according to Estanislao Zeballos, became a national park in mid-1976 (see p 234). Since then the features have been protected and are available for visitor enjoyment and edification. The nation's Congress is ready to accept the ceding (years ago) of neighbouring lands by the province of La Pampa, to increase the area of the park from 9905 hectares to 32,239, that takes in the salt flats, including the famous Levalle salt pan. This will add new species to the lists for the park, especially salt-tolerant plants such as zampa *(Atriplex lampa)* and jumes *(Suaeda and Salicornias)*, as well as increasing the landscape delights and ensuring the conservation and survival of the native species. Lihue Calel will then at last be able to fulfil the commitment for which it was created - to conserve viable samples of all the region's biodiversity.

Useful Data

Lihué Calel National Park

The park was created on 31st May 1976 by national decree Nº 609. It is in the eco-region of the Southern Monte with patches of Espinal woods and at present covers an area of 9905 hectares. Its expansion to 32,239 hectares is pending.

The name is from the Araucanian language but no agreement has been reached as to its meaning: Juan Manuel de Rosas and Manuel J, Olascoaga propose "living flesh"; Estanislao Zeballos and Eliseo Tello understand it as "Hills of life (or of living beings)"; Enrique Steiben believes it means "hill to watch from" or "look-out"; Rodolfo Casamiquela renders it as "Hills of the rectum", "of the large intestine" or even "of the anus"; and Alberto Vuletin: "shining or reverberating body" - so take your pick.

Points of interest are the visitors' centre, the Namuncura valley, the highest point (Cerro de la Sociedad Científica), ruins of the homestead of the estancia Santa Maria, Valle de las Pinturas, Valle de los Angelitos. To get to the park: from Santa Rosa (provincial capital), take Rt 35 southward, then west along Rt 152 (230 Km). Santa Rosa has daily flights from Buenos Aires and busses from all over. One can hire a car, or contact a tour agency or even take a local bus. Some long-distance bus lines (to Neuquen and Bariloche) pass the park entrance. No entry fee is charged. Within the park there is a free camping area with electricity, bathrooms with hot showers, picnic tables, fire sites and firewood. One kilometre south of the park entrance, on Rt 152, there is an Automobile Club motel and roadside restaurant (reservations: 02952 - 436101). The nearest town is General Acha (120 Km NE) that has all services available - even estancias that welcome tourists. Puelches, a village 42 Km SW has a place to eat and a service station. The climate is temperate and dry with great temperature variation through the year.

Winter's average temperature is 7ºC (with frosts between April and mid-October), summer's is 24ºC (with maximum reaching 40). 400mm of rain fall annually, mostly in winter. The best times for a visit are early autumn and spring. Nearby attractions include the largest wind generators in South America some 15 Km from General Acha (62m tall, weighing 100 tons), and 10 Km from Acha, along a paved road through scenic dunes, Utracan lake attracts bathers and fans of water-sports.

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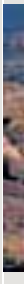

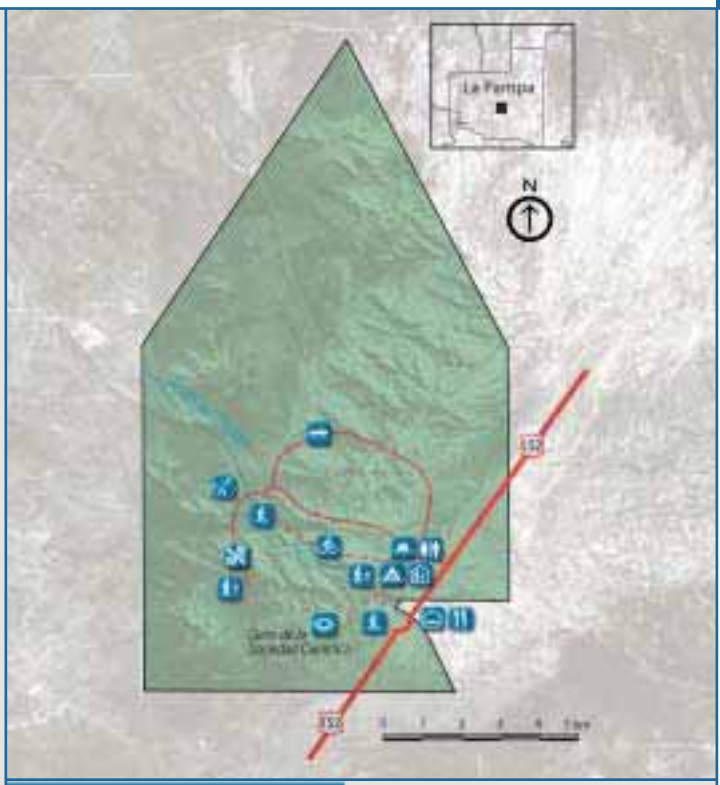

Recreational Activities

Hike

The scenic beauty of Lihue Calel and its gentle topography make any exploration a pleasure. The recreational possibilities are varied. From the camping area a trail leads thought the captivating Namuncura valley, with interpretive panels, to reveal some of the details of the local flora and fauna. Continuing from the end of the trail a well-marked route to the top of the Cerro de la Sociedad Cientifica (590m) leads one to carry on. It is an easy uphill walk, all one requires is the will, reasonable fitness and, at most, a couple of hours. The view from the top is well worth the effort.

From the park's HQ a vehicle track (that may also be walked or cycled) takes one to other places of interest: the old Estancia Santa Maria homestead's adobe ruins, the Angelitos valley with its monumental calden trees *(Prosopis caldenia)*, and the trail head for the Valle de las Pinturas interpretive trail that ends at the rock-paintings themselves (600m of easy walking), explaining on the way the means of living of the original peoples. On any of the walks one can come across a skunk, greater rheas, a pampas cat, and troops of guanacos. In the camping area there are grey foxes, elegant crested tinamous, and a multitude of other birds including the spot-winged falconet. To better enjoy learning about these things while enjoying them, a visit to the neighbouring Interpretive centre is recommended.

Lihué Calel
National Park

Species of Value

Caldén
(Prosopis caldenia)

A large and lovely-shaped tree, this typical ***Prosopis*** *(relation of the Mesquite) is the dominant and characteristic tree of the southern Espinal eco-region. Its distribution covers the south of Cordoba and San Luis provinces, central La Pampa province and a strip in southern Buenos Aires. In Lihue Calel National Park it forms woody patches where streams disappear underground, associated with alpatacos and* ***Jodinia rhombifolia*** *of kite-shaped leaves. The Ranquel people called it* ***trümpel witrú*** *and its woods* ***Mamuel Mapu*** *(land of woods). Towards the end of the XIXth century, when indigenous resistance had been quashed, railways and the axe started sacking the calden woods, first for fire-wood for the bakeries of Buenos Aires and later to cobble some of the streets of that city, or for furnaces since mineral coal was hard to come by during the First World War. Latterly, the wood of the calden is used for parquet flooring. By 1949, when the forest protection laws came into force, there was not much left to protect. The advancing agro-frontier did the rest. Today there is but a vestige f the Ranquels'* ***Mamuel Mapu****. This is regretable because calden woods, under proper management, allow for forestry practices as well as cattle grazing beneath them.*

From staging post to national park

When the process of "araucanization" of the original tribes was completed, Lihue Calel came under the chieftainship of the Salinas Grandes, domain of the fearful and feudal Cura dynasty (*Curá* means stone in Araucanian). With good grazing and permanent water, this became a staging post for the Indians and the hub of a network of trails whereby they drove the cattle they had stolen in Buenos Aires, to Chile. One track was the famous Camino de los Chilenos, joining Buenos Aires to Valdivia. This strategic position led to its being a setting in the "campaña del desierto", Roca's military driving back of the tribes. Expelled from Chilhue, his native empire, Namuncura tried to reorganize his forces in this desert oasis. But the Puan Division under General Levalle, did not give him time. So this son of the great Calfucura fled to the Rio Colorado and final submission.

The swords and Remington rifles of Levalle opened the hills to colonization. At the end of the XIXth century, according to Juan B. Ambrosetti, there lived at the foot of the range a picturesque bunch of cattlemen, farmers, peddlers and rhea-hunters. There was even a couple of Chileans - Sepulveda and Bovadilla - who exploited the copper. They had found the mines (18 shafts) guided by some ancient Jesuit parchment. They were so successful that the area of Lihuel Calel became known as El Mineral.

Over time, however, extensive cattle breeding became the only possible economic activity in the region. In early 1943, Luis Gallardo - son of the renown naturalist and diplomat Angel - bought the lands of Lihue Calel and built his adobe home in the middle. He was not to enjoy it for long. In 1964, the government of La Pampa expropriated his estancia Santa María with a view to its tourist exploitation, but ended up passing it to the National Parks Administration twelve years later.

Pampas Cat
(Lynchailurus pajeros)

This species lives in grassland and scrub habitats as well as open woods, up to 5000 metres elevation. It is considered the most terrestrial of our cats, can be up to one metre long and weigh seven kilos. Though varied in basic colouration, the pointed ears, a long and soft fur, and the black bands across the upper part of its limbs and on its tail are characteristic in all pelages. Though generally nocturnal, here it can be seen in daylight, hunting cavies, field rodents, tinamous and other prey. On the coast of Patagonia it even takes the eggs and chicks of penguins. The species suffered overkill for the commercial value of its pelt (between 1976 and 1979 some 78,000 pelts were exported), but today such hunting pressure is off the species. However, reduction of the habitat it needs as the agricultural frontier advances, keeps it on the list of the threatened species.

The mystery of the peach trees

At the end of 1881, when he first visited Lihue Calel, Estanislao Zeballos unexpectedly found a plantation of peach trees that he believed was the remains of an orderly village. This was enough for him to start t5hinking along the lines of some remote Spanish endeavour. In his **Viaje al País de los Araucanos**, (Trip to the land of the Araucanos), using doubtful sources, he attributed the plantation to the Francisco Villagra expedition which searched for a way to the Atlantic and even claimed to have given rise to the City of the Caesars' myth. Historical research has discredited his claim and the "remains" proved to be natural features. But peach trees still grow in the park, perhaps descended from those seen by Zeballos, to keep alive the shadow of mystery.

Elegant Crested Tinamou
(Eudromia elegans)

Tinamous are the "partridge" of South America. This species is found everywhere from Jujuy to central Santa Cruz provinces in open, scrub, desert or grassy habitats, and even open woods, but tinamous are shy and hard to see till they flush. The name fits - it is certainly crested and elegant. Their flight is low, straight, rowdy, their calls heard all through the warmer months. In winter they gather in large loose flocks. Breeding is the male's duty - he prepares the nest, incubates the eggs and raises the chicks; females are mere factories for producing the eggs. In the camping area they are used to people's

Southern Right Whale

Natural Monument

This whale measures 17m in length (4 cars bumper to bumper) and weighs in at 60 tons (11 male elephants). However, it feeds on tiny organisms - mainly krill, a tiny pelagic shrimp-like crustacean - that it filters out of the sea-water using as a colander the huge baleen plates hanging from its upper mandible. Obviously, it consumes vast quantities - 10,000 tons during its lifetime. It even challenges gravity and amazes us, by fantastic leaps into the air (breaching). During its yearly migration it puts seven times the Earth´s circumference on the clock. Surely this entitles it to a place in the Guinness Book of Records Whaling started in the North Atlantic around the XIth century. The first and favourite species victimized - and for centuries thereafter - was the right whale because it was slow and floated when dead, the right whale indeed. It was persecuted through all the seas and driven to the verge of extinction, the northern population virtually

extinct, the southern reduced to mere vestiges of its former numbers (calculated at less than 4% of the estimated 100,000 that existed before commercial whaling). Other whale species suffered the same fate. As populations crumbled profits did also and whaling came to an agreed halt. Right whales, because of their dramatic collapse, were the first to be protected. In 1935 the International Whaling Commission forbade its harvest. Thereafter it was afforded total protection by the IWC and in the 1970s the CITES (International Trade in Endangered Species) prohibited any trade in its products. These measures allowed the Southern Right Whale to recuperate slowly but surely, which is not the case of the northern species that seems to be on the slippery slope to extinction. Today the population of this, one of our Natural Monuments, is in excess of 8000 individuals and in the south Atlantic, is calculated to be growing at about 7% per year.

Our country was decided and decisive in the conservation of this species. It was a promoter of the IW. Internally it gave protection not only to the whale but to the waters around Valdes Peninsula in Chubut Province, where 35% of the population (some 3200 individuals) comes to breed. In 1974 one of the gulfs (San Jose) was declared a provincial marine park by Chubut and ten years later the national government declared it a Natural Monument and thus gave it total protection in our jurisdictional waters. In 1999 the government moved UNESCO to declare the Valdes Peninsula a World Natural Heritage Site, thus reinforcing our commitment to conserve all biodiversity.

Useful Data

Southern Right Whale Natural Monument

The species was declared a Natural Monument on19th Octubre, 1984, under law 23.094.

Its size is up to 17 metres in length and it weighs 60 tons (females are larger than males). At birth they are five metres long and weigh three tons. The name is because it was the right whale to hunt being an inshore species, easy to catch for its slow speed in the water and it floats when dead, thereby facilitating flensing. The "blow" (when it expels air in breathing at the surface) is in a characteristic "V" shape. It also produced a huge quantity of oil (over 50 barrels) and baleen for stays, umbrellas… the ideal whale.

The species can be observed between May and December in the waters adjoining Valdes Peninsula (San Jose and Nuevo Gulfs). Some 1200 whales arrive to calve and mate. They can be seen from shore (El Doradillo beach near Puerto Madryn is ideal), or from whale-watching excursion boats operating from Puerto Piramide, the only village on the peninsula, and are restricted to the southern Golfo Nuevo. These launches are carefully monitored, operate under strict regulations and seem not to affect the whales in the slightest. They can and are approached to within feet and often practice their breaching nearby, or hold their tails in the air and drift peacefully. One can even witness the gentle interactions of mother and calf, or the blustery competition between males for receptive females. Curiosities: the head of a right whale is one third of its body length. It has whitish "callosities" of crawling crustacean ecto-parasites (whale "lice"). The size and pattern of these patches are unique to each individual and change very little through life, which allows for identification of individuals in subsequent sightings - a handy tool for estimating numbers and conservation purposes.

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Monte León

National Park

The Patagonian coast, with its many colonies of sea-birds and mammals, must be one of the most spectacular eco-regions on the planet. However, until the change of millennium only six of its 4 thousand kilometres were within the jurisdiction and responsibility of our National Parks - the coastal strip of Tierra del Fuego National Park on the Beagle Channel.

In 1997, with a mind to change that shortcoming, the National Parks Administration had in its sights the wild coast presided over by Monte Leon, in the east of Santa Cruz Province. The provincial government approved, the World Bank approved and was willing to fund the improvements and investments that would be needed and that, together with funds accrued from the sale of the Llao Llao hotel, would be spent on the purchase of the land from its owners. The Braun family was prepared to sell, but the price demanded was higher than Parks' possibilities of raising funds and the initiative foundered.

The Fundación Vida Silvestre Argentina (Argentine Wildlife Foundation - FVSA) then approached Doug Tompkins and his wife Kristine McDivitt, North American eco-philanthropists. The Tompkins were happy to oblige - with 1.7 million dollars from their Patagonian Land Trust, the foundation they created to channel funds towards conservation projects in the south of

A splendid sample of the Patagonian coast. *Top left corner:* Magellanic Penguin.

South America, and FVSA, acting as trustee, the Monte Leon estancia was purchased on the 14th May 2001. Eighteen months later (14 November 2002) the land passed into the possession of the National Parks Administration, on its way to become the first coastal and maritime national park in the country.

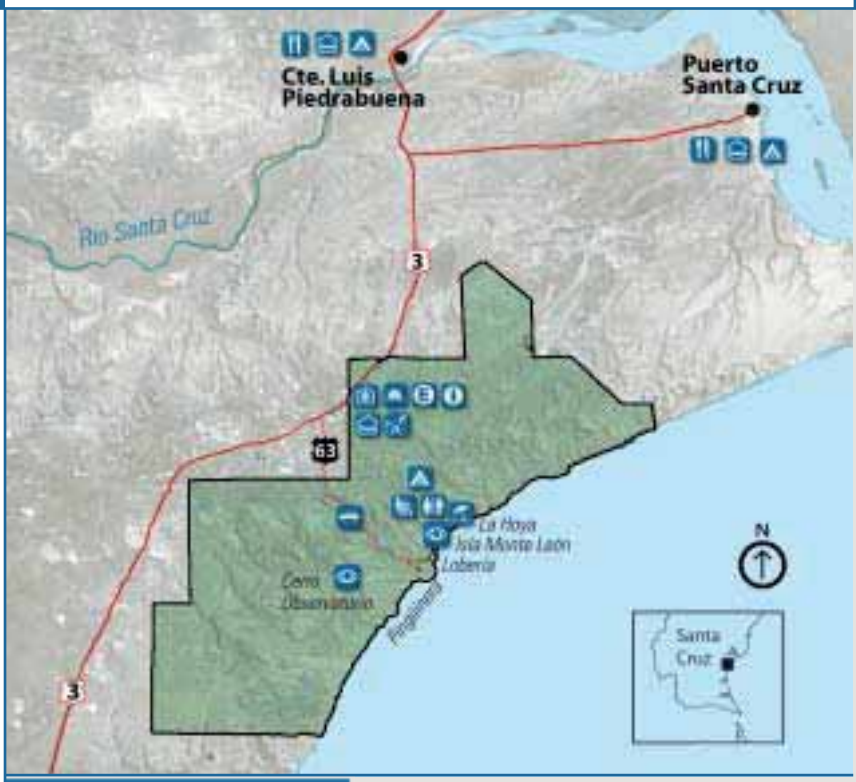
It protects some forty kilometres of coastline and 62,670 hectares of Patagonian steppe, another habitat in urgent need of greater representation in protected areas. Further it has an almost complete sample of coastal Patagonia's biodiversity. The list of its wildlife includes 134 species of birds, 28 mammals, 5 reptiles, and in the waters below the cliffs, 82 of the 300 species of fish of the Argentine sea.

On the shore, each spring, appear two colonies of South American Sea-lions (Pico Quebrado is the larger with over 1000 adults and 500 pups), and one of the five largest breeding colonies of Magellanic penguins with a population estimated at over 70,000 pairs. Also nesting along the coast are blackish oystercatchers, black-crowned night-herons, South American terns, three species of cormorants, two gulls and the two-banded plover. Migrants and wanderers appear or pass by - North American shore-birds, giant petrels. Even so, the greatest spectacle in the park is that offered by the receding tide that leaves tide pools amongst the rocks of the gently shelving shore. Here, in each one of these Lilliputian worlds, a whole community of beings interacts - sea-anemones, starfish, sea-urchins, mussels, crabs, algae - like the work of some inspired aquarium buff.

At sea, the local "haddock" (robalo) and silver "mackerel" (pejerrey) sport among the forests of giant kelp, the piebald Commerson's dolphins breed, and every so often the flat back of a southern right whale breaks the surface. Life is no less active on the dry side of the stony beaches and cliffs. Between the bunch grasses and the shrubs, the severe steppe landscape is home to Patagonian cavies, two species of armadillo, guanacos, pumas, lesser rheas, foxes, elegant crested tinamous, flamingos and the almost mythi-

Monte León

National Park



Recreational Activities

Wildlife observation

For over four decades now the beaches of Monte Leon have been the favourite bathing place for the local community. They are also favoured for fishing for robalo (a sort of haddock called mullet in the Malvinas islands), and pejerrey - a silvery coastal and also fresh-water "mackerel" - only fishing-rods are allowed and a permit is required. When the tide goes out one can reach and explore the Hoya - that sea-cavern that fascinated Moreno, and the intriguing world of the tide-pools. But in the area there is no greater attraction than the wildlife. The penguin colony that begins at the end of Rt 63, may be visited between 4pm and 8pm (the birds are being exposed to human presence gradually). A little further, from the flank of the Lion promontory, there is a sea-lion resting-place to see, sometimes with up to 200 individuals. On the road that leads to the picnic area a balcony overlooks Monte Leon Island and its colonies of sea and coastal birds. In the surrounding steppe one can encounter lesser rheas, foxes, armadillos and, above all, guanacos. Don't forget to take binoculars.

South American Terns

Useful Data

Monte León National Park

The park was created on 10th November 2004 under National Law Nº 25.945. It covers an area of 62.670 hectares of the Patagonian Steppe eco-region.

The name is taken from the Mount (Cerro) Leon (337m) and the sphinx-like "lion" on a headland. Both were characteristic features for reference by mariners.

Points of interest are the penguin colony, the Lion promontory, sea-lion colony, Monte Leon island, La Hoya sea-cavern. The park entrance is at Km post 2385 on Rt 3, the main highway south, 540 Km S from Comodoro Rivadavia and 210 from Rio Gallegos, the provincial capital. The road to reach the coast (Rt 63) heads east across the park from Km post 2391. The nearest localities to the park are Comandante Luis Piedrabuena, 35 km N, and Puerto Santa Cruz, 54 Km away to the NE. Both are served by busses from all over the country and with the enlarging of the airport Puerto Santa Cruz will soon be receiving LADE flights. From either of these towns there are taxis, rented cars with chauffeurs, or vans to take one to the park. There is no entry fee charged and the park is open from November to May. For lodging, food and fuel, the park so far only has a picnic site on the coast, with bathrooms, for day use; drinking water and fire-wood must be brought in by visitors. The homestead of the former Estancia Monte Leon is a lodge and is but a stone's throw from the reception area. It belongs to the Patagonian Land Trust and is run by a grand-daughter of Moritz Braun, the pioneer owner. In the neighbouring localities of Piedrabuena and Port Santa Cruz there are hotels, hostels, cabins for rent, campgrounds, restaurants, stores, service stations and, 20 Km away (S) is Estancia Doraike -a hostel where guests are welcome.

The climate is dry and cold. Average yearly temperature is 6.8ºC with winter minimums well below zero and summer maximums of over 30. Some 250 mm of precipitation fall annually mostly in autumn and winter. Dominant strong winds from W and SW average 15 to 20 kph, gusting up to 100. The best time to visit the park is from mid-November to mid-April. The road to the coast can be cut in times of rain.

Nearby attractions include Doraike hostel where horse riding is offered as also is fishing for trout on the adjacent Santa Cruz river (steelhead run at the end of February), and bird watching. In Piedrabuena one can visit Isla Pavon - a National Historic Site where there is a replica of Comandante Piedrabuena's house and a fish hatchery. Near Santa Cruz await the Cañadón de los Misioneros - site of an unsuccessful mission -, the penguin colony at Punta Entrada and the ria of the Santa Cruz with its beaches, good fishing and nautical activities.

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cal Patagonian possum. The air itself shudders at the stooping of a peregrine falcon or the gliding over-flight of the hunting black-chested buzzard-eagle.

All this does not end the list of things offered by Monte Leon. As if stored in the cliffs there are fossils of giant oysters and crabs that recall a sea that retreated millions of years ago. The evidence of thousands of years of occupation by the indigenous people is found in their shell-middens, arrow-heads, bolas, stone knives, scrapers. The sea-front itself seems a compendium of coastal landforms with its islands, reefs, caverns, cliffs, headland, coves and stony beaches. There is a cavern (La Hoya) that fascinated the scientist and explorer (and father of our national parks) Francisco P. Moreno who wrote in his *Viaje a la Patagonia Austral* (Excursion to southern Patagonia) "What an interesting natural monument! Beautiful tapestries cover the walls, where the tides leave daily evidence of their caresses, and where they invest the life the waters bring, in narrow ribbons of colours that go from green to purply blue. Everything has the soft fuzz of velvet, a living varnish produced by the infinitesimal microscopic organisms or tiny plants"

One particular feature is Monte Leon Island that is a provincial reserve in its own right. It once was the tip of an ancient peninsula, today with the base cut through and cut off from the mainland by the implacable wear of wind and tides. On the top of the cliff-sided block nest thousands of cormorants, gulls and terns.

Monte León
National Park

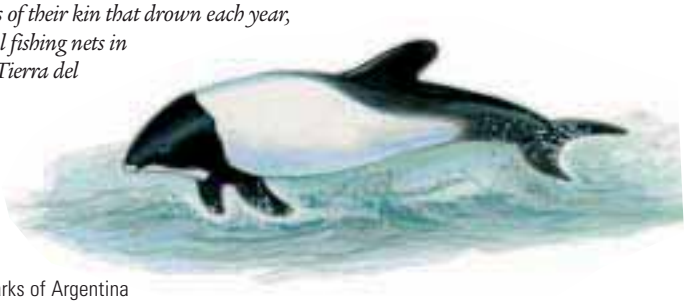
Species of Value

Magellanic Penguin
(Spheniscus magellanicus)

This is the most common of the eight species of penguin in Argentina. It is one of the best swimmers and divers in the animal kingdom. It can descend to 100 metres below the surface of the sea, and on its winter migration it covers thousands of kilometres to the warmer waters off Brazil. It travels in flocks, leaping from the surface to breathe without having to stop - like a porpoise - the action is known as "porpoising". The journey follows the migration of sardine-like fish upon which it gorges, as well as squid and octopus. In this way it builds up reserves. On returning south - having avoided petroleum spills and attacks by such predators as sea-lions, leopard seals, orcas - it is faced by the intimidating task of perpetuating the species. During the breeding season (spring and summer), it takes up residence in traditional colonies on the southern South American coasts, nearby islands, distant archipelagos (Malvinas or Juan Fernandez islands), both in the Atlantic and in the Pacific. From Valdes Peninsula southwards, the Atlantic coast is home to sixty colonies of Magellanic penguins. One of the largest five, with 70,000 pairs, is on 25 hectares of Monte Leon.

Commerson's Dolphin
(Cephalorhynchus commersonii)

This is one of the smallest species of dolphin, measuring up to 1.52 m. It is also one of the most spectacular with its black and white pattern that gave it the nickname of "panda of the seas". It is an eminently coastal species and is found from the mouth of the Rio Negro to southern Tierra del Fuego Most sightings are in spring and summer - the breeding season.
Commerson's dolphin is usually seen in pods of 2 to 8 individuals though there have been records of up to a hundred together. Trusting and amazingly agile, it often accompanies boats and other vessels, leaping or riding the bow-waves or the wake. In Rawson and San Julian there are tours that specifically offer them as the attraction. The diet is that of an opportunist and includes fish, squid, octopus, crustaceans, krill, sponges and even polychaetous worms from the bottom of the sea. Some of the sounds they emit resemble laments. Perhaps this is their way of reproaching us for the hundreds of their kin that drown each year, caught in coastal fishing nets in Patagonia and Tierra del Fuego.



Quilimbay
(Chuquiraga aurea)

*This dense shrub is exclusive to the steppes of Patagonia. Its other local name is "uña de gato". It can grow to half a metre tall, forms rounded bushes and discourages herbivores with its hard and sharp thorns. In January, when it flowers, it is covered with small yellow buttons (referred to in the scientific name under **aurea** that means golden). Hugo Jiménez Agüero, the Santa Cruz folk singer, has given the plant pride of place in his songs.*

South American Sea-Lion
(Otaria flavescens)

There are four such beasts (Otarids for their small but visible eras) in this part of the world and this is the largest of them. A mature bull can weigh up to 350 kilos and a female somewhat less than half that weight - 150. It is also the common species on our continental shores. Between Mar del Plata in Buenos Aires province and Ushuaia in Tierra del Fuego there are 70 colonies of this species. During the breeding season, between December and February, they offer a fiery spectacle. First to arrive are a few bulls who set up territories on the breeding beaches. A few days later the females arrive, most on the point of pupping - and they are gathered into packs (harems) of up to 15 members, under the "protection" of a sultan bull. For these sultans the problems start after parturition. Their task is to fertilize every one of their "wives" while keeping the satellite bachelors or neighbouring sultans from stealing any. This is managed by alternating copulations with fighting and battles, often bloody, accompanied by bellows, huffs and puffs, nibbling and ferocious biting, butting and beatings. They can't even take time off for feeding or resting.

Bygone times

For eons multitudes of birds have nested on the top of Monte Leon Island. Over time they left a thick layer of guano - first-rate organic fertilizer - that covered the whole flat top. Towards the end of the XIXth century, when Chile still had designs over the territories south of the Santa Cruz river, this valuable resource was at the heart of a dispute that nearly led to war between Argentina and its trans-Andean neighbour. In 1876 the Chilean gun-boat Magallanes captured a French vessel as it was loading guano at Monte Leon Island with permission from the Argentine authorities. Two years later, under identical circumstances, it happened again, with the North American Devonshire. The arrival of Argentina's south Atlantic squadron under Captain (as he then was) Luis Py put an end to such provocation and consolidated Argentine sovereignty in the region. Fortunately, later, common sense reigned and agreement was reached by Presidents Roca and Errazuriz at Punta Arenas in 1899. But peace did not return to the winged inhabitants of Monte Leon Island. It was to become the most productive guano deposit in Argentina.

With the passing of time the domain of that pale mount became a sheep farm. This reached its glory some time into the XXth century when the wool trade went global; the farm was managed at first by the British of the Southern Patagonia Sheep Farming Company and later by Moritz Braun, a Chilean merchant of judeo-german origin and legendary business acumen. Nature then had to face new threats. Overstocking, for example, set off erosion and reduced the diversity of fodder plants. Until but a few years ago hundreds of penguin eggs were laced with strychnine to poison foxes though this method killed many other animals and birds as well. The fall in sheep farming made this practice obsolete and the fauna started to return and be seen as a tourist resource. This new vision entailed conservation initiatives. In 1996 the government of the Province of Santa Cruz created the Isla Monte Leon Provincial Reserve. Seven years later the whole area was turned into a national park.

Appendix

Towards a world park

Antarctica

In 1988, to the delight of the petroleum companies, the signatory nations of the Antarctic Treaty approved mining initiatives on the "white continent", thus opening the door to environmental degradation and even, perhaps to acts of war. Three years later they thought again and produced the Madrid Protocol that converted the Antarctic into "a natural reserve dedicated to peace and science" and forbade all mining activity in its area. The accord will be revised in 2041. It is to be hoped that by then humanity will have understood the importance of the Antarctic as a regulator of world climate, the last unchanged natural laboratory and the greatest reserve of fresh water in the world. It will be the only continent free of lucre, weapons, frontiers, the scars of conflict and ecological catastrophes, to be declared a world park.

The Antarctic is also the coldest continent (-88°C has been recorded), the highest in average (2050 metres above sea-level), the windiest (gusts over 300 kph), the driest (less average precipitation than the Sahara), and the only one lacking earth-quakes. Further it is the most aseptic – the environment inhibits even the slightest head-cold – where dead animals take an eternity to decompose. To cap all these peculiarities, at the South Pole there is in the year only one night and one day – each six months long.

And those are not all the oddities. Because of the 20 million square kilometres of frozen sea around it in winter, it triplicates its size, thus moving up the scale from

fourth to third largest continent on earth, larger than Africa. Its load of snow and ice is enough to cover all the other continents with a carpet of snow 33 metres thick and should it melt, raise sea-levels 60 metres. It is home to 90% of the world's ice, 70% of the reserves of fresh water (enough for one million years at the present rate of human consumption), and produces (as ice-bergs) the equivalent of half the fresh water the world uses each year.

What is the use of this "frozen cake"? Not merely to slake our thirst when we have run out of rivers, lakes and underground water. The Antarctic and its belt of sea are the cooling system of the world, a climate factory, and the key factor in marine and atmospheric circulation (currents and winds). It is also the last unsullied laboratory on this planet – an unique opportunity for scientific research.

To Argentina falls the honour of having been the first country in the world (and only one for forty years) to run a permanent base in the Antarctic, the observatory on Laurie island, South Orkneys group, which has been in operation since February 1904. At present our country has 12 bases where various scientific research projects are carried out. Some bases are indeed small villages or hamlets as is the case of Bahia Esperanza (Hope Bay), where the first Antarctic wedding took place and in January 1978 the first child was born on the continent (Emilio Palma, son of the then commander of the base).

In 1990 a park ranger assisted the scientific team of the Antarctic Institute. The experience was fruitful. The next year an agreement was signed between that Institute and the National Parks Administration to send rangers to the South Orkneys, Esperanza and Jubany bases. Ever since then rangers have participated in three biological programmes (monitoring Antarctic systems, sea-birds and mammals) and two geophysical projects (seismology and geodesy). Argentina is the first country to send park rangers to the Antarctic on a permanent basis.

The links of the Antarctic with National Parks has a remote precedent. At the end of 1903 Francisco P. Moreno hosted William Bruce in his home. Bruce was returning through Buenos Aires from an exploratory expedition to the South Orkneys. The Scottish scientist, through Moreno, invited our country to take charge of the observatory on Laurie island, the seed of the first permanent base in the Antarctic.

Life below zero

The Antarctic has but two flowering plants. The fauna, on the other hand, is as varied as the continent itself. In fact some of its wildlife are stars in the Guinness Book of Records. First is the blue whale, the largest animal that has ever existed.

Adelie Penguin
(Pygoscelis adeliae)

This is one of the most numerous Antarctic penguins. It is 50 cm tall and weighs some 4 to 6 kilos. Head and back are black, front white. A ring of white surrounds the eye – looking like a button. Gregarious, it nests in vast colonies an even travels in flocks. Clumsy on ice or land, it is an extremely graceful swimmer, diving to some 170 metres in depth, elegantly and very fast. Feeds mostly on krill though during the nesting season also takes fish, and squid in winter. It is the favourite prey of the leopard seal and the orca; its eggs and chicks are preyed on by skuas and giant petrels. Breeding is in synch with summer - colony forms in October and the pair take it in turns to incubate the two eggs and feed the chicks. There are some 2.5 million pairs on the Antarctic and the sub-Antarctic islands. The greatest concentration is in the Ross Sea.

Leopard Seal
(Hydrurga leptonyx)

Dark grey in colour with yellow and silver spots, it can measure more than 3.5 metres and weigh over 450 kilos (females are larger than males). The name is not only for its spotted coat; it is a ferocious predator that feeds mainly on penguins and other birds, other seals (it eats only the innards and meat, letting the skin wash ashore for others to pick over). Fish and squid complete its diet.
Awaiting the arrival of prey it spends hours on the edge of ice-floes. In winter it moves north to the sub-Antarctic islands though occasionally as far as the River Plate.

Giant Petrel
(Macronectes giganteus)

The silhouette of this species against the sky is impressive – the body is a metre long and the wing-span over two. It follows ships for gash. Unlike other petrels it even attacks lesser species to prey on them. Plumage is from deep chocolate brown to grey (with age), usually paler on the head. There are white individuals with sparse spotting. The heavy and powerful bill is horn coloured with a green tint at the tip. The species is widely distributed at sea in the southern hemisphere. It nests on Antarctic islands and southern South America. Loose nesting colonies generally are by the shore, above stony beaches.

Blue Whale
(Balaenoptera musculus)

The largest animal of all time. Visits the Antarctic during the southern spring and summer to feed on the incredibly abundant krill, consuming three tons a day. Specimens have been measured exceeding 33 metres in length and weighing 150 tons. The average, however, is around 25 m. The heart is the size of a small car and the tongue has the volume of an adult elephant. It is on the list of endangered species because of indiscriminate commercial hunting until 1964. At the beginning of the XXth century there were some 200,000 of these whales in the world; today not more than 8000 are left. The name comes from the tone of the skin – bluish grey on the back. In its mouth some 400 plates of baleen filter the food out of mouthfuls of water. Its dive can last up to half an hour and reach 150 metres in depth. Long-lived, they reach maturity at ten years of age. Gestation takes 11 months; calves are 7 metres long at birth and are cared for and suckled for one year.

Antarctic Flora

There are but two species of vascular plants that grow on the Antarctic: a tiny flower *(Colobanthus quitensis)* and a grass *(Deschampsia antarctica),* restricted to the South Shetland islands and the Antarctic Peninsula. Algae, on the other hand, are legion. To the hundreds of salt-water species must be added others from fresh water and dry-land (living in air). One of them is *Prasiola crispa,* a green alga often found on rocks around nesting birds. Fresh-water algae grow mostly on the edge of ponds. There are even species that grown in the snow, tinting the surface red, green or yellow in spring and summer. Lichens are the dominant vegetation and the best adapted to the severe conditions on dry land. Over 350 species have been recorded, they display a richness and variety unequalled anywhere else on earth. Mosses are more dominant on the islands, covering sea-side plains like a lawn, or rocks and such to look like "cushion plants".

For further enlightenment

Tourist information

National Parks Administration
Information desk: Av. Santa Fe 690, ground floor, (C1059ABN) Buenos Aires, Tel. (011) 4311-0303 interno 147, e-mail: informes@apn.gov.ar. Monday to Friday, 10am to 5 pm. Up to date data on all the areas under the jurisdiction of the Parks Administration, advice on planning a trip and materials for consultation such as maps and pamphlets. Also information as to the Ranger training courses and Volunteers in National Parks.

National Tourism Secretariat
Tourist Information desks: Av. Santa Fe 883, (C1059ABC) Buenos Aires, Tel. (011) 4312-2232 ó 0800-555-0016; Ezeiza International Airport and Jorge Newbery internal airport; e-mail: info@turismo.gov.ar

On the Web
www.parquesnacionales.gov.ar (español-english): official site of the National Parks Administration, with abundant information on the areas under its responsibility and species of fauna that are declared Natural Monuments.
www.parquenacionallanin.gov.ar: Lanin National Park's oficial site.
www.nahuelhuapi.gov.ar: Nahuel Huapi National Park's oficial site.
www.turismo.gov.ar (español-english-portugués): Oficial site of the National Tourism Secretariat, with all the necessary information for visiting Argentina (attractions, localities, services, touristic calendar, World Heritage sites).
www.chaco.gov.ar/turismo: Official site of the Tourism Department of Chaco Province.
www.chubutur.gov.ar: Official site of the Tourism Secretariat of Chubut Province.
www.cordobaturismo.gov.ar (español-english): Tourism gateway for the Province of Cordoba.
www.corrientes.gov.ar/turismo (español-english-portugués): Official site of the Tourism Subsecretariat of Corrientes Province.
www.turismoentrerios.com: Tourism gateway of the Province of Entre Rios.
www.formosa.gov.ar: Official gateway of the government of Formosa Province.
www.jujuy.gov.ar/turismo: Official site of the Secretariat of Tourism and Culture of the Province of Jujuy.
www.turismolapampa.gov.ar: Official site of the Sub-Secretariat of Tourism of the Province of La Pampa.
www.larioja.gov.ar/turismo: Official site of the La Rioja Province's Tourism Agency.
www.misiones.gov.ar/turismo: Official site of the Tourism Sub-Secretariat of Misiones Province.
www.neuquentur.gov.ar: Official site of the Tourism Sub-Secretariat of the Province of Neuquen.
www.rionegrotur.com.ar: Official site of the Secretariat of Tourism of the Province of Rio Negro.
www.turismosalta.gov.ar: Official site of Tourism of Salta Province.
www.turismo.sanjuan.gov.ar: Official site of Tourism of San Juan Province.
www.sanluis.gov.ar (español-english): Oficial gateway of the Government of San Luis Province.
www.scruz.gov.ar/turismo: Official page of the Tourism Sub-Secretariat of Santa Cruz Province.
www.tierradelfuego.org.ar (español-english): Oficial site of the Tierra del Fuego Tourism Institute.
www.tucumanturismo.gov.ar: Official page of the Tucumán Province Tourism Entity.
www.smandes.gov.ar/tresparquessietelagos (español-portugués): Official page of the Siete Lagos Corridor joining Lanin, Nahuel Huapi and Los Arrayanes National Parks.

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Low Impact Practices

These simple recommendations were drawn up by the National Parks Administration's Patagonia Regional Technical Delegation and aim at minimizing the impact of tourist and recreational activities in protected natural areas. The basic philosophy is "leave no trace of ever having been in the place". By following them our children and grandchildren will be able to enjoy the same things we do.

Planning your outing

- Plan an excursion for 10 or 12 people (less if possible). Big groups generate more impact than several small groups: it is harder to manage the group and find good camping areas, and the issue of waste is more problematical. If the group is more numerous try to use organized campgrounds that have certain services – bathrooms, picnic tables, trails, etc. that are prepared to receive lots of visitors.
- Take light and nourishing food in plastic bags or any other containers that can be burnt with ease or carried out with you. Try not to take tins or bottled items. Empty bottles and tins as well as aluminium should be removed when you depart, never buried or burnt.
- Take one or two rubbish bags to collect your garbage in and even for rubbish others may have left. Also a small trowel or some such to bury excrement.
- At all costs avoid introducing exotic species (plants or animals) to the place you Intend to visit.

On hikes

• Walk in single file and do not leave the path. Scattered groups or treading the edge of the trail increases erosion and damages the place.
• Avoid walking on waterlogged soil. Such places are much more susceptible to deterioration.
• Do not take pets on hikes (dogs, cats); dogs, for example are naturally predators and will tend to chase or molest the fauna.
• Keep noise to a minimum. Strange sounds affect the animals' behaviour, and detract from the quality of the natural experience, both for you and other visitors.
• Never take short cuts on zigzags or winding tracks. Circulation along the steeper grades produces a high degree of soil erosion. All "short cuts" suffer severe erosion.
• Take rests off the trail and in places with little vegetation. Resting on the trail obliges other hikers to leave the trail to pass you.

In areas without trails

• The general rule is that only trails are to be used, but sometimes they are not available. In this case:
• Scatter the group and DO NOT walk in single file. To do so where there is no trail creates new trails in wilderness areas where they are not convenient.
• Choose areas with harder surfaces such as rock, gravel or dry stream-beds
• Never leave trail marks (ribbons or other hanging materials, or by flaying tree-trunks with a machete, or break wayside branches). This produces a

negative visual impact in natural terrain; one should cross it without leaving any marks – that is why there are no trails there.

Camping

• Camp only in places where it is allowed; in much frequented areas where open camping is permitted, set up camp in spots already affected by others.
• In places where few camp, use sites free of vegetation. Scatter activities in the camping area so as to avoid trampling any one place severely.
• Never camp in areas that are only slightly impacted so vegetation can recuperate.
• In camp use soft-soled footwear such as gym-shoes or sandals.
• Avoid trampling the vegetation.
• Try to camp near slight elevations with woods. These places are more temperate than valley floors, stream-sides or damp grassland where cold air descends at night. There are usually less bugs there and the vegetation tends to be less susceptible to trampling. It also reduces interfering with wildlife that must come down to water.
• Place your camp so as to be hidden by trees, shrubs or rocks. This increases the impression of solitude and privacy for others.
• If camping on a rise no "ditching" is necessary around your tent. Such runnels can be the start to erosion and leave long-lasting scars. Try to move on before four days to reduce the accumulation of rubbish and avoid damaging the vegetation or soil of the site.
• It is said that "good camping sites are not made but found". Adapt to nature and do not make nature adapt to you. Build no structures such as stone circles around the fire, or beds, benches, shelves and so on. Do not cut living (green) vegetation. Before moving on check to see that there are no signs of your having been there.
• Camping sites or parking lots? Avoid taking your vehicle up to the tent, damaging the vegetation and soil. Do not wash your car in a stream or on its shores.
• If camping in an area where dogs are allowed, keep them under control and tied as much as possible. But it is best not to take your dog or any pet to natural areas.

Fires

• Always take a light stove and try not to make a fire.
• If you must, and only if it is allowed try to use a fire-site that has already been used instead of making a new one.
• Use dry wood that is fallen on the ground, and that can be "cut" (broken) by hand. Logs are home to many living beings. Never cut any standing wood, living or dead.
• If burning rubbish, take with you those bits that were not consumed by the fire.
• Make sure your fire is not too far from water.
• If using a virgin site close a fire-site far from trees and bushes. Try to make your fire on inorganic soil (sand, for example). If not available, remove leaves and twigs till you reach the bare soil, keeping them to burn in the fire. Resist the temptation to build a circle of stones, but if there is

one there, use it. One or two rocks may be used to support the pan, but a full circle is not necessary and will not stop a fire from spreading
• In truth, the best and least impacting way is not to make a fire on the ground but on a metal "base" or a pile of sand on some "lining" such as canvas, a technique known as "fire on a mound".
• Never make a fire right beside a large boulder as the smoke will leave a smutty patch on it; or in a grassland or damp valley bottom where the scar will last a long time. Choose a sandy place or very hard soil.
• Feed the fire a little at a time to avoid burning the surrounding vegetation. Small fire-wood is best as it is completely consumed and produces a layer of good, hot embers. And when you move on there will be no half-burned trunks left over.
• NEVER leave a fire unattended.
• Only smoke in safe places. Burn or remove cigarette stubs and filters.

Sanitation

• Where there is no bathroom or latrine, each person should make a small hole some 20 cm deep (if no trowel is at hand, the heel of a boot will do), at least 60 cm from any course or body of water, and cover the excrements with soil. Wash your hands well but not in a stream or lake. Do not urinate near water, camp sites, or trails.
• For a group of people dig a trench 30 cm deep and no more than 30 wide, at least 60 metres from water, the camp site or trail. After each use cover the excrements with soil and pack down with the foot or trowel. When excrements are some 10 cm from the surface, fill in the trench and disguise it with stones, brush, leaf-litter and such.
• Use biodegradable toilet paper, white and unperfumed.
• Even biodegradable soap pollutes water and harms fish and other forms of aquatic life. Do not wash in streams or lakes. Wash pots and pans, or clothes, far from water-courses or lakes, with "white" washing soap. Dump "dirty" soapy water in a hole. When leaving the site fill in the hole.
• Do not bury trash. Take absolutely everything with you – even fire-remains. If you planned well there will be amazingly little to carry back out.
• Fish guts are to be buried or dumped in the latrine described above. Never leave them on the shore and do not throw them in the water. They dirty the area and allow for the spread of parasites.

Horse riding

• Use the least possible number of horses. Also, apply the recommendations for trail use or crossing land without trails given above for hikers.
• Avoid places or times of the year when the soil is saturated, bogs, springs and seeps. Damp soils are very susceptible to impacts from horses.
• Make your animals drink at fords or rocky stream beds, lake shores. Avoid soft terrain by water. If possible use existing

troughs or a bucket to water your mounts.
• At resting places tie the horse to a stout tree at least 20 cm in diameter. Smaller trees are softer and easy to damage by jerking and the rubbing of the halter or reins. Wrap the rope twice around the trunk before knotting; this reduces damage to the bark (movements by the horse will not rub the rope against the trunk). Choose a dry spot, resistant to trampling.
• If the horse is to be tethered for a long time, stretch a rope above the height of the horse's head, between two stout trees, in a dry place. Tie the horse to this so it can move freely (it will not trample only one spot, nor leave scars on the trees.
• It is always best to hobble the horse so it can move about a bit and graze over a larger area not just at one spot. If tied to a stake driven into the ground, move the animal frequently and remove the stake when you depart.
• Animals that are tied or grazing for long periods should be at least 50 metres from water and camp-sites to avoid contamination of waters, excessive trampling of the vegetation and soil and unseemly depositions of dung and urine.
• Disperse piles of dung (with a stick) to accelerate its decomposition and improve the aspect of the area.
• At rest stops, even short ones, tie the horses off the trail as a consideration for others and to avoid excessive trampling of the trail.
• If possible and advisable_ use llamas in stead of horses – they cause much less damage.

Wildlife

• Observe wildlife from a distance. do not follow or approach animals.
• Never feed the fauna; this endangers their health, changes their natural behaviour and created dependence. Further, it exposes conditioned fauna to predation and other dangers

Leave what you find, where you find it

• Preserve the past: observe but do not touch archaeological, historic or cultural structures and artefacts.
• Leave rocks, plants (and their parts such as flowers) and other natural objects as you find them.
• Avoid introducing or transporting non-native species.

Courtesy

• When hikers and riders meet on a trail, hikers should give right of way to the horses by stepping off the trail on the down-hill side till they pass by, and keep voices low.
• In natural areas, loud radios, tape-recorders, musical instruments and permanent shouting are out of place. Besides, respecting this recommendation one can see much more wildlife.

Acknowledgements

TIRICA Ediciones de la Naturaleza thanks to:

Diana Uribelarrea (APN) and Juan Garay Zabala (OAPNE), for having initiated things for this guide to be undertaken.

Roberto Molinari, Florencia Lance and Marcelo Canevari, for believing in TIRICA Ediciones de la Naturaleza.

Maurice Rumboll and Horacio Paradela, for their enormous efforts.

The employees of the National Parks Administration

Special thanks to Raúl Romero, Silvina Melhem and Romina Caselli (Public use Programme); Marita Ruiz (Department of Conservation and Management of Protected Areas); Carlos Martín, Claudio Chehebar, Mónica Mermoz, Eduardo Ramilo, Cintia Andrade, Silvia Ortubey, Lorena Martínez and Simón Cuminetti (Patagonian Region Delegation); Lucía Ruiz and Valeria Rodríguez Groves (Central Region Delegation); Ana Laura Sureda (Northwest Region Delegation); Federico Bava and Viviana Benesovsky (SIB); Lorena Ferraro and Natalia Spaggiari (Cultural Resource Management Programme); Rodolfo Burkart (Planning); María Teresa Brosz, Pablo Rosso and Mónica Guzmán (Nahuel Huapi NP); Antonio Temporetti, Adriana Rizzetto and Eloy López (Calilegua NP); Marcos Bernuchi (Laguna de los Pozuelos NM); Félix Vidoz (Lago Puelo NP); Néstor Sucunza (Río Pilcomayo NP); Reynaldo Zanello, Pablo Giorgis and Omar Bejarano (Pre Delta NP); Walter Maciel, Carlos Saibene and Pedro Moreira (Otamendi NR); Ariel Rodríguez and Oscar Jansen (Los Alerces NP); Pablo Laclau (Lanín NP); Gerardo Elst (Mburucuyá NP); Raúl Milne (Lihué Calel NP); Carlos Zoratti (Bosques Petrificados NM); Claudia Manzur (Los Arrayanes NP); Arturo Costa Álvarez and Maura García Poggi (Laguna Blanca NP); Germán Peña (Formosa NR); Horacio López (Sierra de las Quijadas NP); Aristóbulo Maranta (El Palmar NP); and Marcelo Almirón (CIES).

To Mónica Ponce (Darwinion Botanical Institute), Alejandro Brown and Silvia Pacheco (LIEY/Proyungas), Mónica Grosso (CASLEO), Mariano Ribas (Galileo Galilei Planetarium), David Rivarola (www.lasquijadas.com), Adelina Toro de Berbel, Andrés Johnson, Alejandro Serret and Agustín Zarco, who contributed in various ways towards this guide.

To Carlos Rabagliatti (Chaco NP); Angel Alzogaray (Copo NP); personnel of the Augusto Schulz House and Museum (Colonia Benítez); Sergio Jiménez and José Luis Colodro (El Rey NP); Daniel Vega, Juan Santillán and Felipe Santiago Nievas; Darío Ramírez, Adriana Orlando, Nicolás Vallejo, Silvina Sandoval, Ailen Vallejo, Jerónimo Altamirano and Marcelo Pietrobon (Quebrada del Condorito NP); and Jorge Juber (Otamendi NR), for the immense assistance given to our team of photographers.

Créditos fotográficos

Julián Alonso: Pages 65; 71 (top, left); 83; 91; 94 (top); 95 (top); 117 (top); 124 (top); 125 (top).
Archivo APN: Pages 12 (below), 14 (top and below).
Archivo Juan Gómez: Pages 30 and 93 (top).
Gustavo Aprile: Pages 79 (below), 105.
Marcelo Canevari: Page 235 (top).
Pablo Canevari: Pages 36; 194 (top).
Ricardo Cenzano Brandón/FNA: Page 75 (right).
Ricardo Ceppi: Pages 150 (top); 150-151; 155 (top).
Roberto Rainer Cinti: Cover; pages 6 (top and centre); 10-11; 15; 16; 18 (all); 19 (all); 21 (left, top, right, top and below); 22 (left, top and below; right, below); 23 (all); 24-25; 26 (top and below); 27 (below); 31 (top and below); 34 (top); 34-35; 38 (top); 38-39; 39 (top); 42; 43; 46 (top); 51; 52 (top); 52-53; 53 (top); 54; 55; 56 (top and below); 57; 59; 60 (top and below); 61; 62 (top); 67 (top) 68-69; 70 (top); 70-71; 71 (top, right); 72; 73 (left); 79 (top); 80 (top and below); 81 (top and below); 84 (below); 85; 88 (top); 88-89; 89 (top); 92 (top and below); 93 (below); 94-95; 96; 98 (top and below); 99; 100 (top); 100-101; 101 (top); 103; 106 (top); 106-107; 107 (top); 108-109; 110 (top); 110-111; 111 (top and below); 112; 113; 114; 115; 116 (top); 116-117; 119; 120 (top and below); 121 (top); 122-123; 124-125; 126; 127; 128-129; 130 (top); 131; 132; 133; 136-137; 137 (top, left); 139; 140 (top); 144-145; 145 (top); 147; 148 (top and below); 149; 151 (top, right); 154; 161; 164 (top); 164-165; 165 (top, left); 167; 170; 171; 174 (top); 175 (top, left and right); 176; 181 (below); 182 (top and below); 183 (below); 185; 186; 187; 188 (top); 188-189; 189 (top); 191; 192 (left); 193; 195 (top); 203; 204 (top); 205 (top, right); 208 (top and below); 209; 211; 212; 213 (left and right); 214-215; 215 (top, left); 220 (left); 222; 223; 226 (top); 226-227; 229; 230 (top); 230-231; 231 (top); 233; 234; 235 (below, left and right); 237; 238 (top); 238-239; 239 (top); 240; 242; 243 (left and right); 244-245; 245 (top); 247; 251 (top); 252 y 255.
Javier Etcheverry/FOTOSCOPIO: Pages 194-195.
Eduardo Haene: Pages 21 (left, below), 136 (top); 156 (top and below) 157 (top); 159.
Andrés Johnson: Page 181 (top, left).
Pablo Olivieri/APN: Pages 62-63 and 63 (top).
Marcos Palma Quintana: Pages 74; 180; 181 (top, right); y 221.
Carlos Alberto Passera: Pages 22 (right, top); 244 (top).
Andrés Pérez Moreno: Pages 29; 41; 153; 168; 179; 199; 202.
Darío Podestá: Pages 27 (arr.); 47 (arr.); 117 (ab.); 137 (arr., der.); 204-205; 205 (arr., izq.) y 206.
Eduardo Ramilo: Page 165 (top, right).
Hernán Rodríguez Goñi: Pages 46-47; 49; 50; 62 (below); 66; 141; 151 (top, left); 155 (below); 160; 220 (right).
Gabriel Rojo: Pages 84 (top); 236.
Gabriel Scattini: Page 183 (top, right).
Claudio Suter: Pages 2, 6 (below), 12-13, 78 (top); 162-163; 169; 174-175; 183 (top, left); 192 (right); 196; 197; 214 (top); 215 (top, right); 217; 218; 219 (below).